РУМЯНЦЕВА О.А.

Вступний курс
з професійної англійської мови
для математиків

ENGLISH FOR MATHEMATICIANS

CONTENTS

ВСТУП

Навчальний посібник «Вступний курс з професійної англійської мови для математиків» призначений для студентів університетів та інститутів математичних факультетів, для студентів, які вивчають математичні дисципліни як фахові і мають базовий рівень чи продовжують вивчення мови в вищих навчальних закладах, а також для аспірантів та викладачів факультетів математики.

Метою створення посібника є безумовна необхідність підготування студентів-математиків для іспитів з англійської мови для отримання бакалаврського ступеня та вступних іспитів до магістратури.

У цьому сенсі даний посібник повністю задовольняє потреби навчальної програми з дисципліни «Англійська мова за професійним спрямуванням», що викладається у 1, 2 та 3 семестрах.

Посібник побудований за тематичним принципом. У нього ввійшли 18 уроків, які в свою чергу розподілені на 3 частини. Перша частина уроку містить фахові математичні тексти з подальшим списком термінології та її перекладу. До першої частини ввійшли наступні 18 тем:

1. Мова алгебри (The language of algebra). 2. Синтаксис мови алгебри (Syntax of the language of algebra). 3. Математичні трансформації (Mathematical transformations). 4. Лінійне рівняння (Linear equation). 5. Множення виразів (Multiplication of phrases). 6. Послідовне застосування правил спрощення виразу (Sequential application of rewriting rules to simplify an expression).7. Одинадцять законів дійсних чисел (Eleven laws of real numbers). 8. Исаак Ньютон (Isaak Newton). 9. Довжина окружності (Circumference of a circle). 10. Альберт Ейнштейн (Albert Einstein). 11. Моделі (Models). 12. Побудова моделі у науці (Model-building in science). 13. Багаточленна функція, специфічні прийоми. (Polynomial function, tricks of the trade). 14. Типи кутів, визначення. (Types of angles, definition). 15. Тригонометрія (Trigonometry). 16. Теорія множини (Set theory). 17. Поняття ймовірності та теореми ймовірності (Probability concepts

and theorems of probability). 18. Проблеми лінійного програмування (Linear programming problems).

Друга частина уроку включає в себе наступні граматичні теми: присвійний відмінок (The Possessive Case); ступені порівняння прикметників (The comparison of adjectives); дієприкметники (The Participles); інфінітив та його конструкції (The Infinitive and its constructions); герундій (The Gerund); умовні речення (The Conditionals). У кінці частини викладені практичні вправи у межі граматичної та лексичної тематики уроку.

Третя частина уроку містить матеріал для розвинення і формування необхідних навичок та майстерності у різноманітних видах мовної та писемної діяльності. Художні тексти на усний переказ, тексти сучасної проблематики для обговорення, діалоги, диктанти, письмові перекази та вправи на переклад складають третю частину уроку.

Для перевірки отриманих знань наприкінці посібнику у розділі «Додатки» наведено також десять модульних тестових завдань, окрім того посібник має тести для перевірки знань студентів з математичної термінології.

Передбачається, що тільки послідовне виконання усіх завдань в аудиторії під керівництвом викладача і вправ для самостійної роботи гарантує досягнення поставленої мети у навчанні.

INTRODUCTION

Applied mathematics

What is applied mathematics?

Applied mathematics is a branch of mathematics that **concerns** itself with the **application** of mathematical knowledge to other **domains**… The question of what is applied mathematics does not answer to **logical classification** so much as to the sociology of professionals who use mathematics.

That is about right, on both counts. In this introduction we shall define **applied mathematics** to be correct as mathematics useful to scientists, engineers and the like; proceeding not from reduced, well defined **sets of axioms** but rather directly from a **nebulous mass** of natural arithmetical, geometrical and classical-algebraic idealizations of **physical systems**; **demonstrable** but generally **lacking the detailed rigor** of the **professional mathematician**.

Applied and professional mathematics **differ** principally and **essentially in the layer of abstract definitions** the latter **subimposes** beneath the physical ideas the former seeks to model. Notions of mathematical rigor fit far more comfortably in **the abstract realm** of the professional mathematician; they do not always translate so gracefully to the applied realm. The applied mathematical reader and practitioner needs to be aware of this difference.

1. Axiom and definition.

Ideally, a professional mathematician knows or precisely specifies in advance the set of **fundamental axioms** he means to use **to derive a result**. **A prime rule** here is **irreducibility**: no axiom in the set should **overlap** the others or **be specifiable in terms of the others**. Geometrical argument —**proof by sketch** — is distrusted. The professional mathematical literature discourages undue pedantry indeed, but its readers **do** implicitly **demand** a **convincing assurance** that its writers could derive results **in pedantic detail** if **called upon** to do so. **Precise definition** here is critically important, which is why the professional mathematician **tends** not **to accept blithe statements** such as that $1/0 = \infty$, without first inquiring as to exactly what is meant by symbols like 0 and ∞. The applied mathematician begins from a different base. This ideal lies not in **precise definition** or **irreducible axiom**, but rather in the **elegant modeling** of **the essential features** of some physical system. Here, mathematical definitions tend **to be made up ad hoc** along the way, **based on previous experience** solving **similar problems**, **adapted implicitly** to suit the model at hand. If you ask the applied mathematician exactly what his axioms are, which symbolic algebra he is using, he usually doesn't know; what he knows is, **for instant**, that the bridge has its footings in certain soils with **specified tolerances**, suffers **such-and-such** a **wind load**, etc. **To avoid error**, the applied mathematician **relies** not **on** abstract formalism but rather on a **thorough mental grasp** of the **essential physical features of the phenomenon** he is trying to model. **An equation** like $1/0=\infty$ may make perfect sense without further explanation to an applied mathematical readership, **depending on the physical context** in which the equation is introduced. Geometrical argument—proof by sketch—is not only **trusted but treasured**. Abstract definitions are wanted only **insofar as** they **smooth the analysis** of the

particular physical problem **at hand**; such definitions are seldom promoted **for their own sakes**.

The irascible Oliver Heaviside, responsible for the important applied mathematical **technique of phasor analysis**, once said, 'It is shocking that young people should be **addling their brains over mere logical subtleties**, trying to understand the proof of one **obvious fact** in terms of something equally . . . obvious.'

Exaggeration, perhaps, but from **the applied mathematical perspective** Heaviside nevertheless **had a point**. The professional mathematicians Richard Courant and David Hilbert **put it more soberly** in 1924 when they wrote, since the seventeenth century, physical intuition has served as a **vital source** for **mathematical problems and methods**. Recent trends and fashions have, however, weakened the connection between mathematics and physics; mathematicians, **turning away from** the roots of mathematics in intuition, have **concentrated on refinement** and **emphasized the postulation side** of mathematics, and at times have **overlooked the unity of their science** with physics and other fields. In many cases, physicists have ceased to appreciate the attitudes of mathematicians.

To the applied mathematician, the mathematics is not principally meant to be developed and appreciated for its own sake; it is meant to be used. The introduction you are now reading is not the right venue for an essay on why both kinds of mathematics - applied and professional (or pure) - are needed. Each kind has its place; and although it is a stylistic error to mix the two **indiscriminately**, clearly the two have much **to do with** one another.

Vocabulary:

Applied mathematics – прикладная математика
to concern oneself with smth.– заниматься чем-либо; соотносить себя с чем-л.
application - применение
domain - поле деятельности, область знаний; область определения, домен
logical classification – логическая классификация
set – множество, набор, ряд, группа учеников или студентов (занимающихся определенным предметом)
sets of axioms – ряд аксиом
nebulous mass – неопределенное множество
physical systems – физическая система
demonstrable - доказуемый
lacking the detailed rigor – отсутствие детальной точности
professional mathematician – профессиональный математик
differ essentially – отличаться существенно
in the layer of abstract definitions – на уровне абстрактных определений
subimpose – подразумевать, помещать, устанавливать в определенном положении
the former - из двух вариантов первый
the abstract realm – абстрактная область
axiom and definition - аксиома и определение
fundamental axioms – фундаментальные аксиомы
to derive a result – получать результат
a prime rule - основное правило
irreducibility - неприводимость; несводимость
to overlap – частично совпадать

to be specifiable in terms of the other axioms – дать определение, используя термины других аксиом

proof by sketch – доказательство с помощью эскиза

distrust - недоверие, сомнение; подозрение

discourage - лишать уверенности в себе; обескураживать; приводить в уныние, удручать

undue pedantry – чрезмерная педантичность

to demand a convincing assurance – требовать убедительное заверение

in pedantic detail – в педантичных деталях; **in detail** в деталях, подробно

to called upon = **to call on** – призывать кого-то сделать что-то

precise definition – точное определение

to tend - иметь тенденцию к ; **to tend to/approach infinity** - стремиться к бесконечности

to accept blithe statements - принимать несерьезные утверждения

irreducible axiom – неприводимая аксиома

elegant modeling – превосходное моделирование

the essential features – важнейшие особенности (свойства)

to be made up ad hoc – составляются специально для данного случая

to be based on previous experience –базироваться на предшествующем опыте

similar problems – подобные проблемы

adapted implicitly – адаптированный полностью

for instant – например

specified tolerances – заданное допустимое отклонение

such-and-such a wind load – такая-то ветровая нагрузка

to avoid error – избегать ошибок

rely on – полагаться на

thorough mental grasp – полное умственное понимание

essential physical features of the phenomenon – основные физические свойства явления

an equation - уравнение; равенство

depending on the physical context – в зависимости от физического состояния

not only trusted but treasured – не только внушающий доверие, но и высоко ценимый

smooth the analysis – облегчать анализ

insofar - постольку поскольку, насколько

at hand - находящийся под рукой; близкий (тж. о времени)

for the sakes of – ради

technique of phasor analysis – методика векторного анализа

obvious fact – очевидный факт

addling their brains over mere logical subtleties – ломать мозги над простыми логическими тонкостями

irreducible axiom – неприводимая аксиома

exaggeration - гиперболизация, преувеличение

the applied mathematical perspective – перспективы прикладной математики

to have a point – иметь смысл

put it more soberly – изложить более разумно

vital source – необходимый источник

mathematical problems and methods – математические проблемы и методы

to turning away from – отклониться от

to concentrate on refinement – концентрироваться на улучшении

to emphasize the postulation side - придавать особое значение постулированию

overlooked the unity of their science игнорировать единство их науки

indiscriminately - неразборчиво, огульно

to do with -находить применение чему-л.; иметь дело с кем-л.; ладить с кем-л.

UNIT 1
Part 1. Text 1: **THE LANGUAGE OF ALGEBRA**

This text is intended as a review of the algebra terminology necessary to understand the rest of this book, allowing the student to gauge his or her mathematical sophistication relative to what is needed for the course. The individual without adequate mathematical training will need to spend more time with this text. The review of algebra is presented in a slightly different manner than has probably been experienced by most students, and may prove valuable even to the mathematically sophisticated reader.

Algebra is a formal symbolic language, composed of strings of symbols. Some strings of symbols form sentences within the language (X + Y = Z), while others do not (X += Y Z). The set of rules that determines which strings belong to the language and which do not, is called the *syntax* of the language. *Transformational rules* change a given sentence in the language into another sentence without changing the meaning of the sentence. We will first examine the symbol set of algebra, which is followed by a discussion of syntax and transformational rules.

1. THE SYMBOL SET OF ALGEBRA

The symbol set of algebra includes numbers, variables, operators, and delimiters. In combination they define all possible sentences which may be created in the language.

1.1. NUMBERS are analogous to proper nouns in English, such as names of dogs - Spot, Buttons, Puppy, Boots, etc. Some examples of numbers are: 1, 2, 3, 4.89, -0.8965, -10090897.294, 0, Π, e.

Numbers may be either positive (+) or negative (-). If no sign is included the number is positive. The two numbers at the end of the example list are called universal constants. The values for these constants are: Π = **3.1416...** **and e** = **2.718....**

1.2. VARIABLES

Variables are symbols that stand for any number. They are the common nouns within the language of algebra - dog, cat, student, etc. Letters in the English alphabet most often represent variables, although Greek letters are sometimes used. Some example variables are: **X, Y, Z, W, a, b, c, k, μ, r.**

1.3. OPERATORS

Other symbols, called operators, signify relationships between numbers and/or variables. Operators serve the same function as verbs in the English language. Some example operators in the language of algebra are: +, -, /, *, =, >, <, $\geq$.

Note that the "*" symbol is used for multiplication instead of the "x" or "•" symbol. This is common to many computer languages. The symbol "$\geq$" is read as "greater than or equal" and "$\leq$" is read as "less than or equal."

1.4. DELIMITERS

Delimiters are the punctuation marks in algebra. They let the reader know where one phrase or sentence ends and another begins. Example delimiters used in algebra are: ( ), [ ], { }.

In this course, only the "( )" symbols are used as delimiters, with the algebraic expressions being read from the innermost parenthesis out.

Task 1. Answer the questions below.
1. What are immediate constituents of the symbol set of algebra?
2. What do we call numbers and what do we call figures in mathematics?
3. What types of numbers there exist in algebra?
4. Give some examples of the universal constants in algebra.
5. Give the definition to the term '*variables'*.
6. What symbols do we call '*operators'*?
7. Why are *delimiters* considered to be the punctuation marks in algebra?
Task 2. Summarize and digest the main theses of the text.

Part 2. Grammar: The Possessive Case – Притяжательный падеж

Существительное в **притяжательном падеже** выполняет следующие функции:
1. Передает отношения принадлежности и служит определением к другому существительному, обозначая принадлежность предмета лицу или предмету, выраженному определяемым существительным: *Kate's room – комната Кати, the boy's bag – сумка мальчика, John's overcoat – пальто Джона, Mum and Dad's room – комната родителей, architect Wren's library – библиотека, принадлежащая архитектору Рену*. Значение принадлежности может также выражаться аналитическим путем – сочетанием предлога **of** с именем существительным: *the boy's father = the father of the boy – отец мальчика, Jack London's novels = the novels of Jack London – романы Джека Лондона*.
2. Передает отношение части и целого: *horse's leg – нога лошади, cat's tail – кошачий хвост*.
3. Отношение источника действия к действию: *Galileo's observations – наблюдения Галилея, Marco Polo's discoveries – открытая Марко Поло, Volochkova's dancing – танец Волочковой*.
4. Авторство: *Thackery's novel – роман Теккерея, Shakespeare's sonnets – сонеты Шекспира, architect Wren's library – библиотека, построенная по проекту архитектора Рена.* *
Обратите внимание на то, что последний пример можно истолковать двояко – в первом случае (принадлежность) притяжательный падеж будет означать то, что Рен является владельцем библиотеки, а в четвертом (авторство) – автором чертежа здания библиотеки.
Иногда существительное в притяжательном падеже **(абсолютная форма – Absolute Form)** может употребляться в редуцированной (краткой) форме, т.е. без определяемого слова, самостоятельно.
1. Когда определяемое слово опускается, чтобы избежать повтора: *My room is bigger than Pete's (than Pete's room). – Моя комната больше комнаты Пита.* Кроме того, во избежание повтора, можно также употреблять неопределенное местоимение **one**: *My room is bigger than Pete's one. – Моя комната больше комнаты Пита.*
2. Названия учреждений и магазинов: *the baker's – булочная, the chemist's – аптека, the grocer's – бакалея*.
3. Имя основателя бизнеса: *McDonald's – МакДоналдс, At Martin's – У Мартина (название ресторана или бара)*.
4. Названия церквей: *St. Paul's = St Paul's Cathedral – Собор Святого Павла*.
5. Названия домов, где живут родственники, друзья или знакомые: *at Timothy's – у Тимоти, at my uncle's – у дяди*.
В форме Possessive Case употребляются следующие категории существительных:
1. Одушевленные существительные (обозначающие живых существ – людей или животных): *Tom's friends, my sister's copybook, the dog's tail*.
2. Существительные, обозначающие **понятия времени** (**moment** – момент, мгновение, **second** – секунда, **minute** – минута, **hour** – час, **day** – день, **week** – неделя, **fortnight** – две недели, **month** – месяц, **quarter** – квартал, **year** – год, **decade** – десятилетие, **century** – столетие, **millennium** – тысячелетие): *an hour's absence – часовое отсутствие, two hours' drive – двухчасовая поездка, a fortnight's vacation – двухнедельный отпуск, three weeks'*

journey – *трехнедельное путешествие*, *a month's leave* – *отсутствие в течение месяца*, *a year's leave* – *отъезд на год*.

3. Субстантивированные наречия, обозначающие **понятия времени** (**today** – сегодня, **yesterday** – вчера, **tomorrow** – завтра, **the day before yesterday** – позавчера, **the day after tomorrow** – послезавтра): *today's newspaper* – *сегодняшняя газета*, *yesterday's accident* – *вчерашняя авария*.

4. Существительные, обозначающие **части дня и времена года** (**morning** – утро, **day** – день, **evening** – вечер, **night** – ночь, **spring** – весна, **summer** – лето, **autumn** – осень, **winter** – зима): *morning's noise* – *утренний шум*, *night's shadows* – *ночные тени*, *day's rest* – *дневной отдых*, *hard day's night* – *вечер после трудного дня*.

5. Существительные, обозначающие **понятия расстояния** (**kilometre** – километр, **mile** – миля, **yard** – ярд): *a mile's distance* – *дистанция в милю*, *two kilometres' walk* – *прогулка на два километра*.

6. Существительные, обозначающие **понятия стоимости** (**pound** – фунт стерлингов, **shilling** – шиллинг, **penny** – пенни, **dollar** – доллар, **cent** – цент, **quarter** – двадцать пять центов, **euro** – евро, **eurocent** – евроцент). Существительные, обозначающие понятия стоимости могут употребляться в составе конструкции **количественное числительное + название валюты в притяжательном падеже + worth + of + название развесного товара**: *one pound's worth of chocolate* – *шоколад на один фунт стерлингов*, конструкции: **название развесного товара + количественное числительное + название валюты в притяжательном падеже + worth**: *chocolate five dollars' worth* – *шоколада на пять долларов*, а также в составе определения **количественное числительное + название валюты в притяжательном падеже + название штучного товара**: *ten hundred dollars' wristwatch* – *тысячедолларовые наручные часы*.

7. Названия **стран и городов**: *Canada's population* – *население Канады*, *London's museums* – *лондонские музеи*, *Washington's monuments* – *памятники в городе Вашингтон*.

* Обратите внимание на то, что последний пример можно истолковать двояко – в первом случае (одушевленные существительные) притяжательный падеж будет означать то, что это памятники человеку – Президенту США Джорджу Вашингтону – безотносительного к тому, где они находятся, а в седьмом случае (название городов) – памятники, находящиеся в городе Вашингтон, безотносительно к тому, в честь кого они воздвигнуты.

8. Следующие существительные: **world** – мир, **country** – страна, **city** – город. Например: world's chess championship – чемпионат мира по шахматам, my country's history – история моей страны, the city's council – городской совет.

9. Собственные и нарицательные существительные, обозначающие **звезды, планеты и другие небесные тела**: *the Sun's rays* – *солнечные лучи*, *the Moon's light* – *лунный свет*, *the earth's surface* – *поверхность земли*, *stars' navigation* – *ориентирование на местности по звездам*.

10. Собственные и нарицательные существительные, обозначающие **реки, моря, океаны**: *the river's rush* – *речной поток*, *the ocean's roar* – *рев океана*, *the Thames's cool waters* – *холодные воды Темзы*.

11. Собственные и нарицательные существительные, обозначающие **корабли**: *the Titanic's sail* – *плавание «Титаника»*, *the ship's crew* – *корабельная команда*.

12. **Застывшие фразеологические сочетания** с существительными, обозначающими разного рода предметы и понятия и стоящие в Possessive Case (**needle's eye** – игольное ушко, **clock's hands** – стрелки часов, **pin's head** – булавочная головка, **at an arm's length** – на расстоянии вытянутой руки, **within a stone's throw = at a stone's throw** – на расстоянии брошенного камня, **for conscience's sake** – для успокоения совести, **for safety's sake** – из соображений безопасности). Обратите внимание на то, что слова **needle, pin, arm, stone, conscience** и **safety** вне этих конструкций употребляются в составе атрибутивной конструкции и не могут употребляться в притяжательном падеже: *Makers install airbags into their cars for safety's sake. – Производители устанавливают подушки безопасности в*

автомобили в целях безопасности. – в этом предложении употребляется Possessive Case, так как слово **safety** употребляется в составе застывшего фразеологического сочетания **for safety's sake**. *Following safety instructions is very important for your security. – Следование правилам техники безопасности очень важно для вашей безопасности.* В этом предложении употребляется Attribute Clause, так как слово **safety** употребляется вне застывшего фразеологического сочетания.

Possessive Case существительных в единственном числе имеет окончание –**'s**, которое произносится как [s] после глухих согласных, [z] после звонких согласных и гласных и [iz] после сибилянтов (шипящих и свистящих звуков, изображаемых в орфографии буквами **s, ss, ce, se, x, ze, ge, dge** или сочетаниями букв **ch, tch, sh**: *the peasant's house; the cat's tail; a month's leave; the girl's dress; the worker's wages; George's brother; the fish's fins.* Обратите внимание на то, что Possessive Case существительных в единственном числе, оканчивающихся на *s* и *ss*: образуется, добавлением окончания –*'s*: *James's wife – жена Джеймса, boss's study – кабинет начальника.*

Существительные, оканчивающиеся во множественном числе на –**(e)s**, образуют Possessive Case во множественном числе прибавлением к окончанию только апострофа: *the horses' hoofs, the dogs' collars, the boys' skates.* Существительные же, не имеющие окончания –**(e)s** во множественном числе (множественное число образуется заменой гласной корня или добавлением окончания **-ren**), образуют Possessive Case множественного числа так же, как существительные в единственном числе, путем прибавления окончания **'s**: *these men's room – комната этих людей, the geese's cry – крик гуся, children's literature – детская литература, the sheep's wool – овечья шерсть.*

Possessive Case составных существительных образуется путём прибавления окончания –**'s** к последнему элементу составного существительного: *my father-in-law's writing-table – письменный сток моего тестя (свекра), the editor-in-chief's study – кабинет главного редактора, this workman's tools – инструменты этого рабочего.*

Base form **Основная форма**	**Possessive Case** **Притяжательный падеж**	**Base form** **Основная форма**	**Possessive Case** **Притяжательный падеж**
существительное в **единственном** числе, **не оканчивающееся на s**			
добавление **апострофа** и s (+'s)			
book of my mother	my mother**'s** book	car of my father	my father**'s** car
существительное во **множественном** числе, **оканчивающееся на s**			
добавление s и **апострофа** (+s')			
car of my parents	my parents**'** car	the book of my friends	my friend**s'** book
существительное в **единственном** числе, **оканчивающееся на s**			
добавление **апострофа** и s (s+'s)			
car of James	James**'s** car		
существительное во **множественном** числе, **не оканчивающееся на s**			
добавление **апострофа** и s (+'s)			
toys of children	children**'s** toys	cry of the geese	geese**'s** cry

Part 3. Practical work:

Exercise 1. Замените форму притяжательного падежа существительным с предлогом of:

My University's library, our Dean's study, the professor's lecture on differential calculus, Odessa's city hall, yesterday's appointment, our group's success, their team's victory, today's meeting, the Pacific's currents, the Sun's rays, the Moon's surface, her Italy's shoes, a mile's distance, a fortnight's leave, for safety's sake, the mathematician's drawings, this programmer's error, the analyst-programmer's conclusion, the financial expert's opinion, the boss's signature.

Exercise 2. Переведите на английский язык:

Двухчасовой перелет, месячная зарплата, экипаж корабля, решение украинского правительства, лучший Оперный театр нашей страны, Одесские улицы и дороги, ошибки студентов, результат вчерашнего матча, карьера системного программиста в компании Майкрософт, компьютерные игры, ответ наших клиентов, мнение его адвоката, приказ ректора, задание нашего преподавателя, прибытие теплохода, отчет факультета ПМ.

Exercise 3. Изложение. Прочтите (или прослушайте) текст. Ответьте на вопросы преподавателя по тексту. Составьте план изложения. Перескажите текст. Напишите изложение, не подглядывая в текст.

A Good Lesson

Once a rich lady phoned the manager of the London Opera House. She said that she wanted to arrange a party and would like to invite one of their well-known singers.

The manager answered that he would make all the necessary arrangements about it. He passed the lady's invitation to Mr. Roy, the best singer of the theater. The man had to accept the invitation though he didn't feel well enough to go to the party after the performance. However, he took a taxi and a few minutes later came to the lady's house. The lady was pleased to see him, but she told him to have supper with the servants. Mr. Roy said nothing. He went to the kitchen, enjoyed his supper and after it sang to the servants with whom he had had supper. The lady did not expect him to stay there so long and called him, as she was not pleased with the delay.

"Will you sing something for us?" she asked him.

"I'm sorry, but I've already sung. You see I always sing for those people with whom I have supper."

With these words he left the room. He gave a good lesson to the rich lady.

to arrange a party – организовать вечеринку; **to make arrangements about smth.** - сделать все необходимые распоряжения по поводу чего-то **to make arrangements with smb.** – договориться с кем-то; **to accept the invitation** – принять приглашение; **to feel well / to feel bad** – чувствовать себя хорошо/плохо; **to take a taxi** - взять такси; **to enjoy supper** – насладиться ужином; **the servants** (pl.) - слуги; **delay** – промедление, задержка

Plan:
1. Introduction. The rich lady's invitation.
2. The main part. At the party.
2.1. The supper with the servants.
2.2. "Will you sing something for us?"
2.3. "I've already sung!"
3. Conclusion. A good lesson to the rich.
3.1. My opinion.

UNIT 2
Part 1. Text 2:   SYNTAX OF THE LANGUAGE OF ALGEBRA

Creating sentences. Sentences in algebra can be constructed using a few simple rules. The rules can be stated as **replacement statements** and are as follows:

> **Sentence => Phrase**
> **Phrase => Number**
> **Phrase => Variable**
> **Phrase => Phrase Operator Phrase**

Delimiters (parentheses) surround each phrase in order to keep the structure of the sentence straight. Sentences are constructed by creating a **lower-order phrase** and sequentially adding greater **complexity**, moving to **higher-order levels**. For example, the construction of a complex sentence is illustrated below:

X + 3
7 * (X + 3)
(7 * (X + 3)) / (X * Y)
(P + Q) - ((7 * (X + 3)) / (X * Y))
((P + Q) - ((7 * (X + 3)) / (X * Y))) - 5.45

Statements such as this are rarely seen in algebra texts because rules exist to eliminate some of the parentheses and symbols in order to make reading the sentences easier. In some cases these are **rules of precedence** where some operations: **multiplication** (*) and **division** (/) take precedence over others: **addition** (+) and **subtraction** (-).

Eliminating Parentheses. The following rules permit sentences written in the full form of algebra to be rewritten to make reading easier. Note that they are not always permitted when writing statements in computer languages such as PASCAL or BASIC.

1. The "*" symbol can be eliminated, along with the parentheses surrounding the phrase if the phrase does not include two numbers as **subphrases**. For example, (X(Y - Z)) may be rewritten as X (Y - Z). However, 7*9 may not be rewritten as 79.

2. Any phrase connected with "+" or "-" may be rewritten without parentheses if the inside phrase is also connected with "+" or "-". For example, ((X + Y) - 3) + Z may be rewritten as (X + Y) - 3 + Z. Continued application of this rule would result in the sentence X+Y-3+Z.

Sequential application of these rules may **result in** what appears to be a **simpler sentence**. The sentence created in the earlier example may be rewritten as:

> ((P + Q) - ((7 * (X + 3)) / (X * Y))) - 5.45
> **Rule 1:**   ((P + Q) - 7(X + 3) / XY) - 5.45
> **Rule 2:**   P + Q - 7(X +3) / XY - 5.45

Often **these transformations** are **taken for granted** and already applied to **algebraic sentences** before they appear in algebra texts.

Vocabulary:

replacement statement - замена формулировки

delimiter - разделитель символ (пробел, табуляция, запятая, скобки, ключевые слова и т.п.) или строка, служащие для разделения между собой каких-либо элементов (данных в файле; записей в базе данных; операторов, имён, выражений или параметров в программе и т.д.)

parentheses (pl.) - круглые, простые скобки

lower-order phrase – выражение низшего порядка
complexity - сложность
higher-order level – уровень высшего порядка
rule of precedence – правило предшествования (или превосходства)
multiplication and **division –** умножение и деление
addition and **subtraction –** сложение и вычитание
eliminating parentheses – устранение скобок
subphrases – составляющие математического выражения
simpler sentence - неразложимое, элементарное выражение
simple fraction — простая дробь
simple equation — уравнение 1-й степени
simple quantity — однозначное число
sequential application – логическое (последовательное) применение
to result in - иметь результатом, следовать, происходить в результате
transformation - преобразование
take for granted - считать доказанным

Test 1. Here is **a written quiz on the Whole Numbers** subject which students learn within their sixth grade in the American schools! Take this easy test, thus you will revise both your English mathematical terminology and your prime skills in mathematics.
Whole numbers:
Place values in whole numbers
1.1. In **73,128**, what number is in the **thousands** place?   A) 7; B) 3; C) 1; D) 8.
1.2. In **51,930**, what number is in the **ten-thousands** place? A) 5; B) 1; C) 9; D) 3.
1.3. In **594**, in which place is the **9**?   A) ones; B) tens; C) hundreds.
Word names for numbers
How do you write this number using words?   **91, 42, 56, 84, 37**
Roman numerals
How would you write 26 as a Roman numeral?
2. Decimal numbers
2.2. Decimal place values
In 2.13, in which place is the 3?   A) tenths; B) hundredths
2.3. Word names for decimal numbers
How do you write 0.1 in words?
A) one thousandth; B) one tenth; C) one hundredth; D) one ten-thousandth
2.4. Convert decimals to mixed numbers
How do you write 0.1 as a fraction?   A) 1/4;   B) 1/50; C) 1/10; D) 1/5
2.5. Put decimal numbers in order
Which set of numbers is ordered from **least** to greatest?
A) 0.26 < 6.32 < 0.62   B) 0.26 < 0.62 < 6.32   C) 0.62 < 0.26 < 6.32
2.6. Inequalities with decimals
Which sign belongs in the blank? 0.618 __ 0.615   A) < ;   B) > .
2.7. Round decimals
 What is 1.7 rounded to the nearest whole number?

2.8. [0]   Round whole numbers and decimals: find the missing digit
Which digit makes this statement true?   A) 9;   B) 0;   C) 1;   D) 2
8,200 is the result when 8,218 is rounded to the nearest hundred.   A) yes;   B) no
2.9. Decimal number lines
Find the value of **j**. Write your answer as a decimal number.

_____.____.____.____.____.____.____.____.____.____.____._____
         0   **j**   **1**

Part 2. Grammar: Participles

There are three kinds of participles in English: present participle, past participle and perfect:

	Active	Passive
Indefinite Participle (Participle I)	asking	being asked
Past Participle (Participle II)		asked
Perfect Participle	having asked	having been asked

You probably know the first two from certain tenses and adjective forms. Apart from that, participles are also used to shorten sentences.

Present Participle (Ving; being + V3)

The present participle is the *ing*-form. You surely know this form:

1. from progressive / continuous tenses (e. g. Present Progressive) – I am *speaking*.
2. as an adjective form – The film is *interesting*.
3. as a gerund – He is afraid of *flying*.

When adding 'ing' you should remember the following rules:

Exception	Example
final *e* dropped (but: *ee* is not changed)	come – coming (but: agree - agreeing)
final consonant after short, stressed vowel is doubled	sit – si**tt**ing
final consonant *l* after vowel is always doubled (in British English)	travel – trave**ll**ing
final *ie* becomes *y*	lie – l**y**ing

The present participle can be used to describe the following verbs: *come, go, sit*

Example: The girl **sat** *crying* on the sofa.

The present participle can also be used after verbs of the senses if we do not want to emphasize that the action was completed: *feel, find, hear, listen to, notice, see, smell, watch*.

Example: Did you **see** him *dancing*?

Furthermore, the present participle can be used to shorten or combine **active** clauses that have the same subject. Example: She left the house *and whistled*. – She left the house *whistling*.

Exercise 1. Fill in the present participle.

An (interest) book, a (sleep) child, two (play) dogs, the (win) number, several (travel) bags, the (move) power, a (touch) moment, an (excite) film, a (work) man, (run) water.

Exercise 2. Rewrite the sentences replacing the italic part with a present participle.

1. She was talking to her friend and forgot everything around her.
   → *Talking to her friend she forgot everything around her.*
2. Since we watch the news every day we know what's going on in the world. →
3. They are vegetarians and don't eat meat. →
4. The dog wagged its tail and bit the postman. →
5. While she was tidying up her room she found some old photos. →
6. He was a good boy and helped his mother in the kitchen. →
7. As they didn't have enough money they spent their holidays at home last year. →
8. The man was sitting in the cafe. He was reading a paper. →
9. Since I didn't feel well I didn't go to the cinema. →
10. She walked home and met an old friend. →

Exercise 3. The verbs in italics are sometimes followed by a participle. Complete the sentences using the Present Participle.

1. She could *feel* herself (blush).   5. We *listened to* the mother (sing) her child to sleep.

2. She *did not see* the car (come) closer.   6. I *smelled* something (burn) in the house.

3. Do you *notice* Tom (talk) to Amelie?   7. I *found* my two cats (sit) on the table.

4. We *heard* the boys (knock) at the door.   8. She jealously *watched* her boyfriend (flirt) with another girl.

Part 3. Speaking activities: Modern technologies and the world culture

Task 1. Do you agree or disagree with the following statement? Modern technology is creating a single world culture. Use specific reasons and examples to support your opinion.

Man, through the ages, has undergone many changes from the time when he depicted a herd of mammoths on the walls of the cave to these days when he can chart with someone on the other side of the globe. Modern technology is rapidly changing the world's living standards that results in creating a single world culture. New technologies including Internet, television, electronic media, means of transportation, etc has a great impact on creating a similar culture all around the globe. Bellow I will list my reasons to support my opinion.

First of all, Internet and e-mail have changed the way people communicate to each other. Internet brought many benefits. It is a new means of communication, a fast access to information and news. People communicate with each other, share their ideas, happiness and difficulties. We have a great opportunity to find out more about countries and their history.

Second of all, the modern means of transportation allows people to move from one place to another very quickly. A few centuries ago it was impossible to imagine somebody waking up in one country and falling asleep in another.

Finally, as a result of all mentioned above the boundaries between countries, their traditions and customs are erased. Many people migrate during their lives. Some of them are looking for a better place to live, others want to get new experience and knowledge or just pleasure. So, many families are created between people from different countries. Traditions fuse and evolve into other ones or just vanish.

To sum up, modern technology has a great impact on the way people live now. It is creating a new single world culture where traditions and distances are no longer of that importance.

Task 2. Translate the following expressions into English.

Подвергаться изменениям; непринужденно болтать с кем-то по интернету; современные технологии; жизненный уровень; мировая культура; электронные средства массовой информации; иметь огромное влияние на; по всему миру; изложить по порядку чьи-либо доводы; поддержать чьё-то мнение; способ общения друг с другом; средства общения; быстрый доступ к информации; разделять чьи-то идеи; современные средства передвижения; великолепная возможность; узнавать больше о странах и их истории; проснуться в одной стране; заснуть в другой стране; вышеупомянутые аргументы; границы между странами и их обычаями; переселяться из одной страны в другую в течение чьей-то жизни; искать лучшее место для жизни; получать новый опыт и знания; создавать семьи; традиции сливаются воедино; создавать новую универсальную мировую культуру.

Task 3. Translate the following sentences from English into Russian or Ukrainian.

1. Every year the students of our University have **to undergo** a medical examination.

2. I was given a task by our instructor in linear algebra **to compile a chart.**

3. Our institution is ready to transfer the **state-of-the-art technology and know-how** to developing countries. We are about to **create a technology** of rapid calculation in this sphere.

4. I think the student would **benefit** by further study. Did you **benefit** from your holiday?

5. He grabbed this **opportunity** of seeing you. She was offered an opportunity to check her error.

6. I'll do anything for you within **reason**. He quit for personal **reasons.**

UNIT 3
Part 1. Text 3:   MATHEMATICAL TRANSFORMATIONS

Transformations are rules for rewriting sentences in the language of algebra without changing their meaning, or **truth value**. Much of what is taught in an algebra course consists of transformations.
Numbers. When a phrase contains only **numbers** and an **operator** (i.e. 8*2), that phrase may be replaced by a **single number** (i.e. 16). These are the same rules that have been **drilled** into grade school students, at least up until the time of new math. The rule is to perform the operation and **delete the parentheses**.
For example: (8 + 2) = 10;   (16 / 5) = 3.2;   (3.875 - 2.624) = 1.251
The rules for dealing with negative numbers are sometimes imperfectly learned by students, and will now be reviewed.
1. An **even number** of **negative signs** results **in a positive number**; **an odd number** of negative signs results in a negative number. For example:

$$-(-8) = -1 * -8 = 8 \text{ or } +8$$
$$-(-(-2)) = -1 * -1 * -2 = -2$$
$$-8 * -9 * -2 = -144$$
$$-96 / -32 = 3$$

2. Adding a negative number is the same as subtracting a positive number.

$$8 + (-2) = 8 - 2 = 6$$
$$-10 - (-7) = -10 + 7 = -3$$

Fractions
A second area that sometimes proves troublesome to students is that of **fractions.** Fractions are an algebraic phrase involving two numbers connected by the operator "/"; for example, 7/8. The top number or phrase is called the **numerator** and the bottom number or phrase the **denominator**. One method of dealing with fractions that has gained considerable popularity since inexpensive calculators have become available is to do the division operation and then **deal with decimal numbers**. In what follows, two methods of dealing with fractions will be illustrated. The student should select the method that is easiest for him or her.
Multiplication of fractions is **relatively straightforward**: multiply the numerators for the new numerator and the denominators for the new denominator. For example:
7/8 * 3/11 = (7*3)/(8*11) = 21/88 = 0.2386
Using **decimals** the result would be:
7/8 * 3/11 = .875 * .2727 = 0.2386
Division is similar to multiplication except the rule is to invert and multiply. An example is: **(5/6) / (4/9) = (5/6) * (9/4) = (5*9)/(6*4) = 45/24 = 1.8750**
or in **decimal form**:   **.83333 / .44444 = 1.8751**
Addition and subtraction with fractions first requires finding the least **common denominator**, adding (or subtracting) the numerators, and then placing the result over the least common denominator. For example: **(3/4) + (5/9) = (1*(3/4)) + (1*(5/9)) = ((9/9)*(3/4)) + ((4/4)*(5/9)) = 27/36 + 20/36 = 47/36 = 1.3056**

Text 3.1.   **TRANSFORMATIONS**

Fractions have a special rewriting rule that sometimes allows an expression **to be transformed to** a **simpler expression**. If a similar phrase appears in both the **numerator** and the **denominator** of the fraction and these similar phrases are connected at the highest level by multiplication, then the similar phrases may be canceled. The rule is actually easier to demonstrate than to state:

CORRECT

8X / 9X = 8/9

((X+3)*(X-AY+Z)) / ((X+3)*(Z-X)) = (X-AY+Z) / (Z-X)

The following is an **incorrect** application of the above rule:

(X + Y) / X = Y

Exponential Notation

A number of rewriting rules exist within algebra to simplify with a **shorthand notation. Exponential notation** is an example of a **shorthand notational scheme**. If a series of similar algebraic phrases are multiplied times one another, the expression may be rewritten with **the phrase raised to a power**. The power is the number of times the phrase is multiplied by itself and is written as a superscript of the phrase. For example:

$$8 * 8 * 8 * 8 * 8 * 8 = 8^6$$
$$(X - 4Y) * (X - 4Y) * (X - 4Y) * (X - 4Y) = (X - 4Y)^4$$

Some special rules apply to exponents. A negative exponent may be transformed to **a positive exponent** if the base is changed to one divided by the base. A numerical example follows: $5^{-3} = (1/5)^3 = 0.008$

A root of a number may be expressed as a base (the number) raised to the inverse of the root. For example:

$$\sqrt{16} = \mathbf{SQRT}(16) = 16^{1/2}$$
$$<5576 = 5761/5>$$

When two phrases that have the same base are multiplied, the product is equal to **the base** raised to the sum of their exponents. The following examples illustrate this principle. $18^2 * 18^5 = 18^{5+2} = 18^7$

$$(X+3)^8 * (X+3)^{-7} = (X+3)^{8-7} = (X+3)^1 = X+3$$

It is possible to raise a decimal number to a decimal power, that is "funny" numbers may be raised to "funny" powers. For example:

$$3.44565^{1.234678} = 4.60635$$
$$245.967^{.7843} = 75.017867$$

Binomial Expansion

A special form of **exponential notation**, called **binomial expansion** occurs when a phrase connected with addition or subtraction operators is raised to the second power. Binomial expansion is illustrated below:

$$(X + Y)^2 = (X + Y) * (X + Y) =$$
$$= X^2 + XY + XY + Y^2 = X^2 + 2XY + Y^2 \, ;$$
$$(X - Y)^2 = (X - Y) * (X - Y) =$$
$$= X^2 - XY - XY + Y^2 = X^2 - 2XY + Y^2$$

A more complex example of the preceding occurs when the phrase being squared has more than two terms. $(Y - a - bX)^2 = Y^2 + a^2 + (bX)^2 - 2aY - 2bXY + 2abX$

Vocabulary:

Transformation – 1. преобразование, 2. трансформация

truth value - истинностное значение

number – 1. число; сумма, цифра

high number — большое число (googolplex - гуголплекс (число 10 в степени "гугол"))

low number — небольшое число

algebraic number – относительное число, алгебраическое число

complex number – комплексное число

compound number – составное именованное число

decimal number – десятичное число

even number – четное число

odd number – нечетное число

imaginary number – мнимое число

infinite number – бесконечное число

irrational number – иррациональное число

mass number – массовое число

mixed number – смешанное число

natural number – натуральное число

negative number – отрицательное число

positive number – положительное число

prime number - простое число

whole number, integer, single number - целое число

without number - великое множество, без числа

untold number - огромное количество

round number, approximate number - приблизительное число

operator – оператор

to drill – обучать, натаскивать (в учебе); вдалбливать, вбивать (что-л. кому-л.)

to delete the parentheses – раскрыть скобки

negative sign – отрицательный знак

fraction - дробь

common fraction, simple fraction, vulgar fraction — простая дробь

complex fraction, compound fraction — составная дробь

decimal fraction — десятичная дробь

improper fraction — неправильная дробь

irreducible fraction — несократимая дробь

proper fraction — правильная дробь

to reduce a fraction — сокращать дробь

numerator - числитель

denominator – знаменатель

common denominator – общий знаменатель

to deal with - иметь дело, рассматривать вопрос, решать задачу

relatively straightforward – сравнительно простой

addition and subtraction – сложение и вычитание

to transform to a simpler expression – упростить до простого выражения

cancel - сокращать (дробь, уравнение)

exponential notation - экспоненциальное представление

shorthand notational scheme – схематическое условное обозначение

the phrase raised to a power – выражение, возведенное в степень

exponent - экспонент, показатель степени

base - основание (логарифма, степени, системы счисления)

binomial expansion - биномиальное разложение

Part 2. Grammar: Past Participle (V3)

The past participle is the participle that you find in the third column of the list with irregular verbs. You surely know this form:

1. from perfect tenses (Present Perfect Simple) – I have *spoken*.
2. from passive voice – The letter was *written*.
3. as an adjective form – I was *bored* to death.

For irregular participle forms see third column of irregular verbs. Regular verbs form the past participle by adding *ed*, however, note the following exceptions in spelling:

Exceptions when adding *ed*	**Example**
after a final *e*, only add *d*	love – love**d**
final consonant after a short, stressed vowel	admit – admit**ted**
or *l* as final consonant after a vowel is doubled	travel – travel**led**
final *y* after a consonant becomes *i*	hurry – hurr**ied**

The past participle can also be used to shorten or combine **passive** clauses that have the same subject.

Example: The boy *was given* an apple. He stopped crying. – *Given* an apple, the boy stopped crying.

Exercise 1. Fill in the Past Participle.

1. the (lose) son
2. an (interest) audience
3. a (break) leg
4. an (empty) bottle
5. a (close) door
6. a (decorate) room
7. two (pack) bags
8. the (write) letters
9. the (sell) car
10. the (buy) apples

Exercise 2. Complete the sentences and make clear that the people don't / didn't do it themselves. (The first sentence is given as an example.)

1. Yesterday, (I / cut / my hair). - I had my hair cut.
2. Every Friday, (Joe / wash / his car).
3. Tomorrow, (she / repair / her shower).
4. Each Saturday, (we / deliver / a pizza) to our home.
5. Last year, (Bob / clean / his house) by a charwoman.
6. As Phil had a broken arm, (he / type / his texts) by his secretary.
7. (I / pick up / the goods) tomorrow in the afternoon.
8. (we / redecorate / our walls) last summer.
9. Whenever Clara is staying at this hotel, (she / carry / her bags) into her room.
10. (We / organise / our last party) by professionals.

Exercise 3. Rewrite the sentences replacing the italic part with a past participle.

1. I have a cat that is called Tari.→ I have a cat called Tari.
2. The dinner was more expensive than they had expected. →
3. He was accused of murder and arrested. →
4. She was shocked by the bad news and burst into tears.   →
5. The event is organised by our team and will surely be a great success.   →
6. The film is based on real events and tells the story of a reporter.   →
7. She was born in Hollywood and knows all the famous movie stars.   →
8. The car was taken to the garage. It was repaired within an hour.   →
9. She was admired by everyone and began to grow arrogant.   →
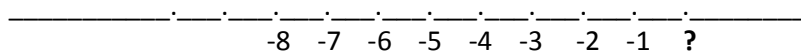10. He was dumped by his girlfriend and felt really lousy.   →

Test 2
1. Integers

1.1. Understanding integers:
Which integer represents this scenario? 5-dollar price increase.
1.2. Absolute value and opposite integers: What is the absolute value of -33? What is $|{}^-63|$?
1.3. Number lines with integers: Write the missing number.

_____.___.___.___.___.___.___.___.___.___.___._____
‎   -8 -7 -6 -5 -4 -3 -2 -1 **?**

1.4. Compare and order integers:
Which words make this statement true? ${}^-4$ ____ ${}^-3$
A) is greater than   B) is less than

2. Rational numbers

2.1. Compare rational numbers: Which sign makes the sentence true? ${}^-2.2$___${}^-2.6$
A) >;   B) <;   C) =
2.2. Put rational numbers in order: -8, 65, 0, 3, 8, 2.99, 3, -12.8
2.3. Absolute value of rational numbers: What is the absolute value of   -7.13?
2.4. Add and subtract rational numbers:
Add. Simplify your answer and write it as a proper fraction or as a whole or mixed number.
$4 + 3 =$
2.5. Multiply and divide rational numbers:
Multiply. Simplify your answer and write it as a proper fraction or as a whole or mixed number.
$2 \times 1 =$

3. Exponents and square roots
3.1. Write multiplication expressions using exponents: Write the expression using an exponent.   3
$x \; 3 \; x \; 3 =$
3.2. Evaluate exponents: Solve for p. $3^p = 243$
3.3. Exponents: solve for the variable: Solve for x. $x^4 = 81$
3.4. Exponents with decimal bases: Evaluate: $(0.06)^2$
3.5. Exponents with fractional bases: Evaluate: Write your answer as a fraction or whole number.
$(\frac{3}{4})^2 =$
3.6. Understanding negative exponents
3.7. Evaluate negative exponents
Evaluate. Write your answer as a fraction or whole number without exponents: $4^{-1} =$
3.8. Advanced exponents Evaluate. Write your answer as a fraction or whole number without
exponents. $(\frac{1}{6})^{-4} =$
3.9. Square roots of perfect squares: What is $\sqrt{64}$?
3.10. Estimate square roots: Which two integers is $\sqrt{7}$ between?
A) 5 and 6;   B) 0 and 1;   C) 2 and 3;   D) 4 and 5

Part 3. Speaking activities.

Read and retell the story.

THE MODERN VENUS

It happened in Rome. George Arnold, a poor artist, who had come from the USA to Italy to study art, fell in love with Mary Brown, the beautiful daughter of a rich American businessman. The girl loved the young sculptor too, but her money-loving father would not allow her to marry George.

One day Mr. Brown called the young man to his office and said to him, "My dear sir, I cannot allow my daughter to marry a poor man. If you want to be my daughter's husband you should have fifty thousand dollars. When you show me the money you can marry my daughter."

George was at a loss what to do. He did not know what to answer. He had no idea how to get such a big sum of money. "You must get the sum within six months," Mr. Brown added. "If you don't get the money she will marry another man." George went home. He felt very unhappy. "What am I to do?" he thought. He had nothing to sell except a beautiful statue of a girl – his last work. But he knew that nobody would buy it ad he was not famous.

His thoughts were interrupted by the arrival of John Smith. John Smith was a pleasant clever fellow. George had made friends with him on board a steamer. They had come to Italy by the same steamer and they had been good friends since. George told John about his conversation with Mary's father and asked him for advice.

"You say, he gives you six months to get the money, doesn't he?" asked John. "It's a lot of time and I'll help you. But promise not to protest if I do something that you don't like." "I promise," George answered.

John came up to the statue, broke off her nose, part of her right arm and her left leg. Then he put on his hat, took the statue and left.

Two months later a story appeared in one of the Italian newspapers. It said that Mr. John Smith, an American gentleman, had bought for a small sum of money a piece of land not far from Rome. One day while digging the earth he found a wonderful statue of a beautiful woman. Unfortunately, the nose, the left leg and the right arm were gone. The experts said they were sure that the statue was a Venus and the work of some unknown artist. They also stated that it cost about ten million francs. Mr. Smith was to be paid five million francs and the statue was to be taken to one of the Italian museums. "Good luck!" said the Americans and immediately decided to form a company which would buy up lands in Italy.

As to George Arnold he married Mary Brown and they lived happily but George never mentioned to anybody what he knew about the famous Venus.

(After "The Modern Venus" by Mark Twain)

UNIT 4

Part 1. Text 4.   LINEAR EQUATION

A linear equation in two **variables** x and y is of the form $ax + by + c = 0$, ($a \neq 0$; $b \neq 0$) where a, b, c are real numbers. To find a solution for this equation, we can assign any value for one of the variables and find the value of the other variable such that the two sides of the equation are equal. Hence we say a linear equation in two variables has indefinitely many **solutions**.

But we often study more than one equation in the same two variables at the same time. The equations **under consideration** are said to form simultaneous equations. We shall study in this chapter, a pair of linear equations in two variables, and methods of finding solutions common to both the equations.

Simultaneous Equation

Solving two equations simultaneously means to find the common solution of both the equations, i.e., a solution which satisfies both the equations. (Such a common solution, if it exists, can be shown to be unique.)

Types of Simultaneous Linear Equations

On the basis of number of solutions of system of simultaneous linear equations we have two types of system of simultaneous linear equations. These are Consistent system and In-Consistent system.

Graphical Method of Solving Simultaneous equation

The graph of a linear equation $ax + by = c$ is a straight line. Two distinct lines always intersect at exactly one point unless they are parallel (have the same slope).

Method of Elimination (by Addition)

Solve the Systems of linear equations by Method of Elimination (by Addition):

$3x - 4y = 20$ (1)
$5x + 6y = 8$ (2).

Solution: Multiply (1) by 3 and (2) by 2:

$$9x - 12y = 60$$
$$\underline{10x + 12y = 16}$$

Adding the two, $19x = 76$

Substituting $x = 4$ in (2), we get: $5(4) + 6y = 8$
$6y = 8 - 20$
$6y = -12$ $y = -2$

The solution is $x = 4$ and $y = -2$.

Substitution Method

Solve the Systems of linear equations by Method of Substitution:

$2x - 9y = 0$ (1)
$x - 18y = 27$ (2).

Solution: From (1) we can find x: $2x - 9y = 0$; $2x = 9y$; $x = 9y/2$ (3).

Substituting this value of x in (2), we get, $9y/2 - 18y = 27$
$9y - 36y = 54$
$-27y = 54$
$y = -2$

Substitute this value of y in (3): $x = 9/2*(-2) = -9$.

The solution is $x = -9$ and $y = -2$.

Problems on Simultaneous Equations

Solve the following Systems of linear equations:

1. If one number is thrice the other and their sum is 60, find the numbers.

Solution:

Let the numbers be x and y.   X is 3 times y; so $x = 3y$ (1)

Sum of x and y is 60: $x + y = 60$ (2)

Putting the value of x from (1) in (2), we get, $3y + y = 60$; $4y = 60$; $y = 15$

Substituting $y = 15$ in (1), we get, $x = 3 * 15 = 45$. The required numbers are 15 and 45.

2. Find the fraction which becomes 1/2 when the denominator is increased by 5 and is equal to 1/3 when the numerator is **diminished** by 4.

Let the fraction in question be $\frac{x}{y}$. When y is increased by 5, fraction becomes

Then   =   or   2x = y + 5;   so   2x - y = 5   (1)
When x is diminished by 4, fraction becomes.
3x - y = 12   (2)
2x - y = 5   (1)
Subtracting (1) from (2), we get x = 7
Substituting x = 7 in (1), we get,   2 * 7 - y = 5

$$- y = 5 - 14$$
$$- y = - 9$$
$$y = 9$$

The fraction is $\frac{7}{9}$.

Summary:
Finding the solution by the method of substitution.
1. **Coefficients** of one of the variables (say x) in the two equations are made equal, by multiplying them with suitable factors.
2. By addition or subtraction, this variable (x) is **eliminated**.
3. The value of the other variable (y) is obtained and by substitution we obtain x.

Method of substitution
We get x in terms of y (or y in terms of x) from one of the equations and substitute in the other equation. Thus one of the variables is eliminated and we proceed as in the previous case.
In problems involving two unknowns, we replace them by x and y. We express the given conditions algebraically in the form of two linear equations and solve for x and y.

Vocabulary:
linear equation - линейное уравнение, уравнение первой степени
variable - переменная (величина)
dependent variable - зависимая переменная
independent variable - независимая переменная
random variable - случайная переменная
solution - 1) решение, разъяснение; 2) метод решения (проблемы)
to apply a solution - применять решение
to find a solution - найти решение
solution of a difficulty - разрешение затруднения, решение трудного вопроса
easy solution, glib solution - решение
ideal solution - идеальное решение
ingenious solution - оригинальное решение
satisfactory solution - удовлетворительное решение
under consideration - на рассмотрении, рассматриваемый, обсуждаемый
simultaneous equations - 1) система уравнений, 2) совместные уравнения
graphical method - графический метод
method of elimination - метод исключения (неизвестного)
elimination by substitution - исключение способом подстановки
substitution method – метод подстановки
diminished - уменьшенный; сокращенный
summary - краткое изложение, конспект, сводка, резюме
coefficient - коэффициент; показатель

Part 2. Grammar: Perfect Participle (Having + V3 ; having been + V3)
The perfect participle can be used to shorten or combine clauses that have the same subject if:

1) one action (the one where the perfect participle is used) is completed before the next action starts.

Example: *She bought* a bike and cycled home. – *Having bought* a bike, she cycled home.

2) one action has been going on for a period of time when another action starts.

Example: *He had been living* there for such a long time that he didn't want to move to another town. – *Having lived* there for such a long time, he didn't want to move to another town.

The perfect participle can be used for active and passive voice.

a) active voice: having + past participle (Having cooked, he set the table.)

b) passive voice: having been + past participle (Having been cooked, the food looked delicious.)

Exercise 1. Rewrite the sentences replacing the italic part with a perfect participle.

1. We switched off the lights before we went to bed.
   → Having switched off the lights we went to bed.
2. The boy asked his mother's permission and then went out to play.
   → … the boy went out to play.
3. As he had drunk too much, he didn't drive home himself.
   → … he didn't drive home himself.
4. We have written two tests today, so we are very exhausted.
   → … we are very exhausted.
5. She filled the washing machine and switched it on.
   → … she switched it on.
6. She had been to the disco the night before and overslept in the morning.
   → … she overslept in the morning.
7. We had worked in the garden all day and were sunburned in the evening.
   → … we were sunburned in the evening.
8. She had not slept for two days and therefore wasn't able to concentrate.
   → … she wasn't able to concentrate.
9. Since I had not seen him for ages, I didn't recognize him.
   → … I didn't recognize him.
10. I had not ridden a horse for a long time and found it very difficult to keep in the saddle.
    → … I found it very difficult to keep in the saddle.

Exercise 2. Fill in the Perfect Participle. Decide whether to use active or passive voice.

1. (stop) the car, the police officer wanted to see the documents.
2. (write) the test, we felt relieved.
3. (work) all day, we were quite exhausted in the evening.
4. (send) to counter 24, I had to return to counter 3.
5. (confess) , he was accused of even more criminal offences.
6. (arrive) at the station, we called a taxi.
7. (type) by the secretary, the letter was signed by the boss.
8. (interrupt) several times, he was rather annoyed.
9. (live) in Oxford for two years, she spoke English like a native speaker.
10. (rescue) , the injured man was taken to hospital.

Part 3. Speaking activities.
3.1. Read and retell the text.

WHAT HAPPENED WHILE THE TRAIN WAS IN THE TUNNEL?

One day, a few years ago, a train was travelling through the English countryside. This was in the days when trains had small compartments, and in one particular compartment there were four people. There was a young girl, quite pretty, who looked like a student or someone who was starting her first job; there was an old lady, dressed in black with bags and magazines and knitting; there was an army officer in his mid-thirties, immaculately dressed in his uniform and very stiff and proper in his manner; and finally there was a young cockney, casually dressed with a sparkle in his eye and ever ready to have a joke.

It was quite obvious that both the men were attracted to the young girl, though the officer certainly wouldn't show it and the cockney felt inhibited by the presence of the others.

Suddenly the train went into a tunnel; the lights had not been put on, so for half a minute the carriage was in complete darkness, and in the darkness came the sound of a large kiss followed almost immediately by a loud slap. What had taken place while the train was in the tunnel? When the train finally emerged and it was light again in the carriage, there for all to see was the officer with a bleeding nose and a swollen eye. And the old lady, seeing this, thought to herself, "What a brave young girl, who dared to hit the officer for stealing a kiss in such a cowardly way!"

And the young girl, seeing the suffering of the officer, was puzzled. "How strange", she thought, "that officer should kiss the old lady, and not me!"

The poor officer, nursing two injuries that caused him more than a little pain and embarrassment, considered to himself "That cockney's quite a clever chap! He kissed the girl, and the girl hit me!"

And the cockney laughed silently to himself at the trick he had played. "I am a clever chap," he thought to himself. "I kissed the back of my hand hit the officer in the face and nobody said a word!"

3.2. Dictation

Mrs. Green was the manager of a large company, and she frequently had to have meetings with other business people in a room in her building. She did not smoke at all, but many of the other people at the meeting did, so she often found the air during the meetings terrible. One day, after an hour, her throat and eyes were sore and she was coughing a lot, so she called a big air-conditioning company and asked them to work out how much it would cost to keep the air of the meeting room in her building really clean.

After a few days the air-conditioning company sent in two estimates for Mrs. Green to choose from. One estimate was for $ 5,000 to put in new air-conditioning, and the other was for $ 5.00 for a sign which said, NO SMOKING.

Task: Before writing a dictation, the students should answer these questions:
1. Why did Mrs. Green have to have meetings with business people?
2. Why did she often find the air in the meetings terrible?
3. What did it do to her?
4. What did she do about it?
5. What did the air-conditioning company send?
6. What did Mrs. Green have to choose between?

UNIT 5
Part 1. Text 5:　　　　MULTIPLICATION   OF   PHRASES

When two expressions are connected with the **multiplication operator**, it is often possible to "multiply through" and change the expression. In its simplest form, if a number or variable is multiplied by a phrase connected at the highest level with the **addition or subtraction operator**, the phrase may be rewritten as the variable or number times each term in the phrase. Again, it is easier to illustrate than to describe the rule: **a * (x + y + z) = ax + ay + az**

If the **number or variable is negative,** the **sign** must be carried through all the resulting terms as seen in the following example:

$$\textbf{-y(p+q-z) = - yp - yq – yz = - yp - yq + yz}$$

Another example of the application of this rule occurs when the number -1 is not written in the expression, but rather inferred:

$$\textbf{- (a + b - c) = (- 1) * (a + b - c) = - a - b - c = - a - b + c.}$$

When two additive phrases are connected by **multiplication**, a more complex form of this rewriting rule may be applied. In this case one phrase is multiplied by each term of the other phrase: **(c - d) * (x + y) = c * (x + y) - d * (x + y) = cx + cy - dx – dy.**

Note: **binomial expansion** discussed earlier was an application of this rewriting rule.

Factoring. A corollary to the previously discussed rewriting rule for multiplication of phrases is factoring, or combining like terms. The rule may be stated as follows: If each term in a phrase connected at the highest level with the addition or subtraction operator contains a similar term, the similar term(s) may **be factored out** and multiplied times the remaining terms. It is the opposite of "multiplying through." Two examples follow: **ax + az - axy = a * (x + z - xy)**

$$\textbf{(a+z) * (p-q) - (a+z) * (x+y-2z) = (a+z) * (p-q-x-y+2z)}$$

Vocabulary:

multiplication and division operator - оператор умножения и деления

addition and subtraction operator – оператор сложения и вычитания

negative and positive sign – отрицательный и положительный знак

to factor out - выносить за скобки, факторизовать

factoring - 1) разложение на множители; 2) разложение на элементарные операции; 3) расстановка; 4) вынесение за скобки

binomial expansion - биномиальное разложение

5.1. Fractional numbers – Дробные числительные

Common Fractions (Простые дроби)

½ - a (one) half
$^1/_3$ - a (one) third
$^2/_3$ – two thirds
¼ - a (one) quarter, a (one) fourth
¾ - three quarters, three fourths
$^1/_5$– a (one) fifth
$^2/_5$ – two fifths
$^1/_6$– one sixth
$^5/_6$– five sixths
1 ½ - one and a half
2 ¼ - two and a (one) quarter

Decimal Fractions (Десятичные дроби)

0.1 - nought point one; point one (Br. Eng.)
        zero point one (Am. Eng.)
0.01 - nought point nought one;
        point nought one
2.35 – two point three five
32.305 – three two (or thirty-two) point
         three nought five

1.   **В   простых   дробях**   числитель   выражается   количественным числительным, а знаменатель – порядковым числительным: **1/3** – a (one) third;

1/5 – a(one) fifth, **1/8** – an (one) eighth. Однако **½** читается: a (one) half (a не: one second); **¼** - a (one) quarter (реже: a fourth).

Когда числитель больше единицы, знаменатель принимает окончание **–s: 2/3** – two thirds; **3/5** – three fifths; **5/6** – five sixths. Существительное, следующее за дробью, стоит в единственном числе: **2/3 ton** (читается: two thirds of a ton); **¾** kilometre (читается: three quarters of a kilometre); **½ ton** (читается: half of a ton).

2. Существительное, к которому относится смешанное число, употребляется во множественном числе: **2 ½ tons** (читается: two and a half tons or two tons and a half); **4¼ tons** (читается: four and a quarter tons or four tons and a quarter).

3. В десятичных дробях целое число отделяется от дроби точкой (в русском обозначении десятичных дробей целое число отделяется от дроби запятой). При чтении десятичных дробей каждая цифра читается отдельно. Точка, отделяющая целое число от дроби, читается **point.** Нуль читается **nought**. Если целое число равно нулю, то оно часто не читается **: 0.25 –** nought point two five or point two five; **14.105** – one four (fourteen) point one nought five.

Существительное, следующее за десятичной дробью, стоит в единственном числе, когда целое число равно нулю: 0.25 ton (читается: nought point two five of a ton). В других случаях существительное стоит во множественном числе: 1.25 tons (читается: one point two five tons); 23.76 tons (читается: two three (or twenty-three) point seven six tons).

4. Проценты обозначаются следующим образом: 2% = 2 per cent = 2 p.c. 3/8 p.c. – three eighths per cent; ½ % - a half per cent или a half of one per cent.

Exercise 1. Try to find the corresponding figures to the following statements:
1. The population of the Vatican city _____
2. The number of hairs on you head _____
3. The world population on 4.07.2000 at 9.40 am_____
4. The year of the first modern Olympic Games_____
5. The chances of being killed in a plane crash_____
6. The biggest recorded crowd at a football match_____
7. The amount of your brain that is water _____
8. The distance from the earth to the sun_____
9. The speed a cheetah can reach when running at top speed_____
10. The money saved by an airline company in a year by removing one olive
from each of their salads in first class_____
11. The average number of official earthquakes per year_____
12. The speed that a sneeze leaves your mouth_____
13. The average number of times a year you blink _____
14. The height of Mount Everest _____
15. The chances of being killed by lightning_____

6,064,290,130	770	$40,000	8,848m	148,500,000km	100km/hr	50,000	10,000,000
1 in 25,000,000	1896	200,000	100,000	1 in 2,000,000	180km/hr	80%	

Part 2. Grammar: Use of Participle Clauses
If a clause is shortened using a participle construction, the clause is called participle clause.
Example: *Watching TV*, she forgot everything around her.

In English, participle clauses are mainly used in writing in order to put a lot of information into one sentence.

When shortening or combining clauses with a participle construction, keep the following rules in mind:

1. Both clauses should have the same subject.
2. The less important part becomes the participle clause. Important information should always be in the main clause.
3. Make sure, you use the correct participle form (see above).
4. The conjunctions *as, because, since* and relative pronouns *who, which* are left out.
5. The conjunctions *before, when* are used in the participle clause.
6. The conjunctions *after, while* can be used or left out.

Participle Clauses with different Subjects

Sometimes participle clauses can be used even if the clauses to be combined do not have the same subject. This is the case for example if the main clause contains one of the following *verbs + object: feel, find, hear, listen to, notice, see, smell, watch.*

Example: I heard him playing the guitar.

Here, the participle clause must directly follow the object it is relating to. (Note: Some of the verbs mentioned here can also be used with the infinitive. For further information see Infinitive or Ing-Form)

A participle construction is also possible, if both subjects are mentioned (often the word 'with' is put before the subject in the participle clause). This is very formal, however, and not often used.

Example: *Mrs Jones went* to New York. Mr Smith took up her position.

→ *(With) Mrs Jones going* to New York, Mr Smith took up her position.

Incorrect Participle Clauses

Apart from the exceptions mentioned above, participle clause and main clause should have the same subject. Otherwise the sentences might sound rather strange.

Example: I was driving on the motorway, when the baby started to cry.

False: Driving on the motorway, the baby started to cry.

In this example you get the feeling that the baby has driven the car. So these participle clauses are considered wrong in standard English. In colloquial English, these 'incorrect participle clauses' are usually okay, and you can even find an example in Shakespeare's Hamlet:

Now, Hamlet, hear. Tis given out that, sleeping in my orchard, a serpent stung me.

As the text goes, it is said that Hamlet's father was bitten by a snake. Strictly speaking, however, the snake was asleep when it bit Hamlet's father.

Exercise 1. Which form is correct? (Present Participle or Past Participle)

  1. I am (interesting, interested) in history.
  2. The party was (boring, bored).
  3. I was (boring, bored) to death.
  4. The (baking, baked) dog kept us awake at night.
  5. Did you see Justin (dancing, danced)?
  6. (Running, run) away from the castle, Cinderella lost a shoe.
  7. History is very (interesting, interested).
  8. The car race was (exiting, exited).
  9. (Exiting, exited) about their birthday party, the girls could not sleep.
  10. He was sitting on the floor (playing, played) the guitar.

Exercise 2.
Fill in the correct participle form (Present Participle, Past Participle or Perfect Participle).
1. He was sitting in an armchair (reading, read, having read) a magazine.

2. (Working, worked, having worked) in the company for many years, he knew everyone and everything.

3. The cup (filling, filled, having filled) with milk stood on the table.

4. (Not seeing, not seen, not having seen) each other for ages, they had a lot to talk about.

5. (Bearing, born, having born) into a rich family, she got everything she wished for.

6. (Being, been, having been) the child of poor people, he often went to bed hungry.

7. (Regretting, regretted, having regretted) his words, he apologised.

8. Well, (doing, done, having done) we are very proud of you.

9. (Parking, parked, having parked) the car, he went to a restaurant.

10. (Watching, watched, having watched) the film a dozen times, she knew the dialogues by heart.

Exercise 3. Combine the clauses using participle constructions (Present or Past Participle).

1. The boy who carried a blue parcel crossed the street. → *The boy carrying a blue parcel crossed the street.*

2. The battle was fought at this place. The battle was very significant. →

3. She lay in her bed and wept bitter tears. →

4. The books which were sent to us are for my aunt. →

5. She stood at the corner and talked to her friends. →

6. The children went from house to house. They played trick or treat. →

7. He was very tall. He became a basketball player. →

8. He was waiting in the hall. He overheard a conversation. →

9. The picture which was stolen from a museum was offered on the underworld market. →

10. The song which was sung last night is still in my head. →

Exercise 4. Combine the clauses using participle constructions (Present, Past or Perfect).

1. We were sitting in the bus shelter and waited for the rain to stop. → *We were sitting in the bus shelter waiting for the rain to stop.*

2. The documentation which was telecast last Tuesday was impressive. →

3. We had great fun at the party. We played silly games. →

4. He had saved a little money. He travelled to Australia. →

5. They were chatting along and didn't see the car coming. →

6. The reception had been prepared carefully and was a great success. →

7. He was picked up by his mother and didn't have to wait for the bus. →

8. She had finished her degree and started to work for an international company. →

9. She was listening to the radio and didn't hear the doorbell. →

10. The room had not been tidied up yet and looked like a battlefield. →

Exercise 5. Combine the clauses using participle constructions (Present, Past oder Perfect Participle). Decide whether to use the conjunctions in the participle clause or not.

1. As she didn't have a boyfriend, she flirted with every guy she met. →

2. Since he had never been there before, he was stunned. →

3. Before he left the house, he switched off the lights. →

4. As she was on holiday, she couldn't go to the party. →

5. While she was preparing dinner, she cut her finger. →

6. When I travel around Ireland, I always stay in youth hostels. →

7. Since she didn't hear the doorbell, she missed the delivery. →

8. After I had dropped him at the station, I drove straight to the supermarket. →

9. Since he didn't feel well, he stayed in bed. →

10. While they were talking on the phone, they forgot everything around them. →

Exercise 6. Replace the Relative Clause by a Participle Construction while keeping the rest of the sentence unchanged. (The first sentence is given as an example.)

1. The boy who was waiting in the hall expected a phone call. →

2. Passengers who wanted to go to Liverpool had to change in Manchester. →

3. The girl who was picked up by her brother was very nice. →
4. The house that stands at the end of the road will soon be sold. →
5. The conference which was planned by non-governmental organisations was about globalisation. →
6. Irish people who live in Great Britain have the right to vote in British elections. →
7. A friend who helps you in need is a good friend indeed. →
8. A picture that shows the image of a person is a portrait. →
9. The problems that were discussed will be essential for your exam. →
10. Animals that eat plants are called herbivores. →

Exercise 7. Rewrite the sentences without using the participle constructions.
1. We were sitting around the fire singing songs. →
2. Did you see the boy jumping up and down? →
3. When going to London, they always did a sightseeing tour. →
4. While being on the boat, Bob got seasick. →
5. Being an exemplary pupil, he always does his homework. →
6. Having told me the news, he went away. →
7. The boy excited about the presents sat on the couch. →
8. Sleeping in the garden, I didn't hear the telephone. →
9. The children were sitting at the beach building a sandcastle. →
10. Last month I read a book written by a Scottish author. →

Test 3
1. Прибыв до открытия конференции, они успели осмотреть город.
2. Она сидела и улыбалась. Подумав, что она сказала это в шутку, я рассмеялся.
3. Этот человек, сидящий у окна, вчера сделал интересный доклад по теории вероятности.
4. Когда я смотрел этот фильм, я вспоминал детство. Услышав шаги, я поднял голову.
5. Я прочел несколько книг этого автора, переведенных на русский язык.
6. Люди, ожидавшие вас, только что ушли.
7. Будучи очень расстроенным, он решил уйти, не прощаясь.
8. Дома, построенные много лет назад, не столь удобны, как современные.
9. Постучав дважды, они решили, что дома никого нет.
10. Не чувствуя себя виноватым, он отказался извиниться.
11. Он показал мне список товаров, экспортируемых этой фирмой.
12. Женщина, открывшая мне дверь, выглядела очень мило.
13. Они стояли и громко разговаривали. Купив билеты, мы все поспешили к вагону 5.
14. Полученные вчера известия произвели на всех большое впечатление.
15. Я не мог переодеться, так как оставил свои вещи на вокзале в камере хранения.
16. Не зная причины ее отсутствия, я решил позвонить ей.
17. Поздоровавшись со всеми, он вошел в свой кабинет.
18. Будучи в Киеве, я посетил Киево-Печерскую Лавру.
19. Будучи мальчишкой, я любил играть в футбол и баскетбол.
20. Будучи усталым, он сразу же поехал домой.
21. Секретарь отправил подписанные директором письма.
22. Его неожиданный ответ удивил всех нас. Он сказал эти слова и улыбнулся.
23. Увидев, что такси подъехало к дому, он взял вещи и быстро спустился вниз.
24. Говорившая по телефону девушка, наконец, повесила трубку.

Part 3. Practical work:
Exercise 1. Translate the fairy tale from Russian into English.
Давным-давно в Северной Африке жил да был старый купец, и было у него 17 верблюдов. Когда пришло время умирать, пригласил купец своих троих сыновей и сказал им: «Я хочу

оставить вам в наследство 17 верблюдов. Поделить вы должны их следующим образом: старший сын должен взять половину верблюдов, среднему сыну я дам треть верблюдов, а младший получит девятую часть верблюдов». Когда отец умер, братья не смогли решить такую легкую задачу, и начали ссориться. Старший брат подумал и решил, что нужно идти к местному мудрецу за советом. Старый человек внимательно выслушал их и вынес вердикт. Он сказал: «Послушайте, это же просто. Возьмите моего верблюда, и у вас станет 18 верблюдов. Тогда старший сын получит половину, т.е. 9 верблюдов, средний – треть, т.е. 6 верблюдов, а младшему достанется 2 верблюда: 9+6+2=17. Останется один верблюд, который принадлежит мне. Таким образом, желание вашего отца будет выполнено, вы можете идти, а мне нужно отдохнуть.

Exercise 2. Fill in prepositions or adverbs. Retell the text. Read the full version of this story in original and tell the continuation of it.
Text 3.1.:   **A SHARK**
It happened … board … steamer going … Europe … the East. Miss Smith, a tall girl … eighteen was … board with her mother. Her father was a high official somewhere … the East and they were going to join him. She was a pretty girl and easily made friends … everybody. All the passengers … board thought the girl wonderful. There was nothing she could not do better than any woman and than most men: sing, play, dance, dive and dress. She was an artist in all that. There was a big tank … sea water … board the steamer. The passengers threw small coins … it and the girl dived and easily collected the coins.

One day the ship arrived … the port of Colombo. All the passengers knew that native boys were good divers. Miss Smith wanted to see the boys dive, and the old captain allowed the boys to come … board. Miss Smith took a collection … small coins and threw them into the sea watching the boys dive and get them. One boy … twelve or thirteen was an excellent diver. He dived most beautifully. Suddenly the boy got … … the water and helped his friends to get … as well. “What's happened?” asked Miss Smith. “A shark, I think,” said the captain. He told the boys to go away, but Miss Smith protested. “Please, one moment, captain,” she said. She asked the best diver if he would dive again. “Shark!” he said looking … the sea. “No,” she said, “There is no shark, dive again,” and she threw a coin … the sea. That made no impression … the boy. Some … the passengers tried to protest but Miss Smith took no notice … their protests. Looking … the boy she threw a lot … coins … the sea. At first the boy was … a loss what to do. But then he dived after the coins. The moment the boy entered the water something terrible happened. The shark cut him in half.

(After Jack London)

UNIT 6
**Part 1. Text 6.   SEQUENTIAL APPLICATION OF REWRITING RULES
TO SIMPLIFY AN EXPRESSION**

Much of what is learned as algebra in high school and college consists of learning when and what **rewriting rules** should be applied to a sentence **to simplify** that sentence. Application of rewriting rules change the form of the sentence, but not its meaning or **truth value**. Sometimes a sentence in algebra must be **expanded** before it may be simplified. Knowing when to apply a rewriting rule is often a matter of experience. As an exercise, simplify the following expression:

$$((X + Y)^2 + (X - Y)^2) / (X^2 + Y^2)$$

EVALUATING ALGEBRAIC SENTENCES

A sentence in algebra is evaluated when the **variables** in the sentence are given specific values, or numbers. Two sentences are said to have similar truth values if they will always **evaluate** to **equal values** when evaluated for all possible numbers. For example, the sentence in the immediately preceding example may be evaluated where X = 4 and Y = 6 to yield the following result:

$$((X + Y)^2 + (X - Y)^2) / (X^2 + Y^2)$$
$$((4 + 6)^2 + (4 - 6)^2) / (4^2 + 6^2)$$
$$(10^2 + -2^2) / (16 + 36)$$
$$(100 + 4) / (52)$$
$$104 / 52$$
$$2$$

The result should not surprise the student who had correctly solved the **preceding simplification**. The result must *ALWAYS* be equal to 2 as long as both X and Y are not zero. Note that the sentences are evaluated from the "**innermost parenthesis out**", meaning that the **evaluation** of the sentence **takes place in stages**: phrases that are nested within the innermost or inside parentheses are evaluated before phrases that contain other phrases.

Vocabulary:

rewriting rule - правило подстановки
simplify (v.) - упрощать(ся), делать более простым
truth value - истинное значение
equal values - равные значения
expand (v.) – 1. раскрывать скобки; 2. растягивать(ся), расширять(ся); увеличивать(ся) в объеме, в размерах
variable(n.) - переменная (величина)
dependent variable — зависимая переменная
independent variable — независимая переменная
random variable — случайная переменная
preceding simplification – предшествующее упрощение
innermost (adj.) - находящийся в самой глубине; самый дальний внутренний
parenthesis (n.,pl.) – скобки
inside parenthesis – внутренние скобки
takes place in stages – происходить поэтапно
evaluate (v.) - вычислять; выражать в числах
to evaluate the root — находить корень;
to evaluate an indeterminate form — раскрыть неопределенность
evaluation (n.) - оценка, определение, определение ценности, определение стоимости

Part 2. Grammar: **THE INFINITIVE**

Table 1. Forms:

Forms of the Infinitive	Active	Passive
Indefinite Infinitive	**to write**	**to be written**

Continuous Infinitive	to be writing	to be written
Perfect Infinitive	to have written	to have been written
Perfect Continuous Inf.	to have been writing	to have been written

The infinitive is the base form of a verb. It may be preceded by 'to' (the *to-infinitive)* or stand alone (the *base or zero infinitive).*

2. Infinitive with or without '*to*':

The to-infinitive is used:

after certain verbs. e.g. ***want, wish, agree, fail, mean, decide, learn***

after the auxiliaries **to be to***, ***to have to***, *and* **ought to**

in the pattern 'it is + adjective + *to-infinitive'*

Table 2.Examples:

with '*to*'

The elephant **decided** *to marry* the mouse.
The mouse **agreed** *to marry* the elephant.
You **will have** *to ask* her.
You **are** *to leave* immediately.
He **ought** *to relax.*
She **has** *to go* to Berlin next week.
It's easy *to speak* English.
It is hard *to change* jobs after twenty years.
It's stupid *to believe* everything you hear.

without '*to*'

1. **Had better** – лучше бы (при переводе всегда идет ссылка на будущее время)

I **had better** come back later. - Будет лучше, если я приду позже.
You'**d better** rest for a while. – Вам стоило бы отдохнуть.

2. **Would rather** - лучше, охотнее, предпочтительнее

She **would rather** play tennis than watch TV. — Она лучше будет играть в теннис, чем смотреть телевизор.

Exercise 1. Translate from Russian into English looking at Table 1.

1. Ты должен написать это модульное задание без ошибок и получить 100 баллов. 2. Это упражнение, должно быть, написано вами с помощью словаря. 3. Что сейчас делает твой брат? - Он, наверное, пишет статью на конференцию. 4. И давно он ее пишет? - Статья, возможно, пишется им каждый день с 3 до 4, а затем он идет на тренировку. 5. Он, возможно, уже написал статью вчера. 6. Статья, должно быть, была написана им 3 дня тому назад. 7. Он, вероятно, пишет эту статью уже в течение недели.

Exercise 2. Translate from English into Russian.
The continuous infinitive: I'd really like to be swimming in a nice cool pool right now. You must be joking! I happened to be waiting for the bus when the accident happened.
The perfect infinitive: Someone must have broken the window and climbed in. I would like to have seen the Taj Mahal when I was in India. He pretended to have seen the film. If I'd seen the ball I would have caught it.
The perfect continuous infinitive: The woman seemed to have been crying. You must have been waiting for hours! He pretended to have been painting all day.

Exercise 3. Translate from English into Russian looking at Table 2.
We **had better** negotiate the prices. I **would rather** *visit* Rome. She **would rather** *live* in Italy. **Would you rather** *eat* steak or fish? He **would rather** *work* in a bank. **I'd rather** *be* a forest than a tree. She'**d better** please the professor. She'**d better** not surprise the audience. He'**d better** not upset Mr. Banks. You'**d better** not irritate your family. I think I **had better** go home now. He'**d better** not spend a lot of money. They'**d better** spend more time on their English. We **had better** *take* some warm clothing. She **had better** *ask* him not to come. You'**d better** *not smile* at a crocodile! We **had better** *reserve* a room in the hotel. You'**d better** *give* me your address. They **had better** *work* harder on their grammar!

NEGATIVE INFINITIVE
To form the negative infinitive, place **not** before the *to-* or *zero infinitive:* e.g. ***not to worry:***
>   It's hard ***not to worry*** about exams.
Examples:
>   I decided ***not to go*** to London.

He asked me *not to be* late.
Elephants ought *not to marry* mice.
You'd better *not smile* at the crocodile.
I'd rather *not eat* meat.

INFINITIVE FUNCTIONS

The most common uses of the infinitive are:

1. To indicate the purpose or intention of an action (where *'to'* has the same meaning as *'in order to'* or *'so as to'*): She's gone to collect her pay cheque. The three bears went into the forest to find firewood.

2. As the subject of the sentence:

To be or not to be, that is the question.

To know her is to love her. (Note: this is more common in written English than spoken)

3. With nouns or pronouns, to indicate what something can be used for, or what is to be done with it:

Would you like something to drink?

I haven't anything to wear.

The children need a garden to play in.

4. After adjectives in these patterns:

It is + adjective +to-infinitive: It is good to talk.

It is + adjective + infinitive + for someone + to-infinitive: It is hard for elephants to see mice.

It is + adjective + infinitive + of someone + to-infinitive: It is unkind of her to say that.

5. After an adjective + noun when a comment or judgement is being made:

It was a stupid place to park the car.

This is the right thing to do.

It was an astonishing way to behave.

6. With too and enough in these patterns:

too much/many (+ noun) + to-infinitive:

There's too much sugar to put in this bowl. I had too many books to carry.

too + adjective + to-infinitive: This soup is too hot to eat. She was too tired to work.

too + adverb + to-infinitive: He arrived too late to see the actors.

enough (+ noun) + to-infinitive: I've had enough (food) to eat.

adjective + enough + to-infinitive: She's old enough to make up her own mind.

not enough (+noun) + to-infinitive: There isn't enough snow to ski on.

not + adjective + enough + to-infinitive: You're not old enough to have grand-children!

Exercise 1. Translate the sentences from Russian into English.

Вопрос слишком сложен, чтобы на него сразу ответить. Задача слишком сложна, чтобы ее уже решили. Слишком он ленив, не читал он книги в подлиннике. Я стоял слишком далеко, чтобы слышать, что она говорит. Они достаточно хорошо говорят по-английски, чтобы не нуждаться в переводчике.

Exercise 2. Model: She is nice **to work** with. His story was hard **to disapprove.**

С ним трудно разговаривать. С ней приятно иметь дело. Его рассказу трудно поверить. С вами сегодня легко вести переговоры. Его нелегко было остановить. На нее приятно было смотреть. Этому легко поверить.

Exercise 3. Model: do smth. (in order/so as) **to get** smth.

I have come here **to speak** to you. She pretended to be quite well **not to be taken** to the doctor.

Я еще раз прочел сообщение, чтобы лучше понять его. Он бежал всю дорогу, чтобы успеть на поезд. Я все это говорю, чтобы меня правильно поняли. Она ничего не рассказала, чтобы начальник отдела не наказал ее.

Exercise 4. Model: to do smth is (was, will be) necessary … ; it is necessary **to do** smth …

To tell her the truth now is not at all necessary. It's necessary **to explain** everything to her.

Знать грамматику – значит писать без ошибок. Подумать так было просто смешно. Сказать "да" было невозможно, сказать "нет" было невежливо. Объяснить ему, что это такое, было делом трудным. Рассердиться было глупо. Помогать ей – значит делать все самой. Трудно переводить этот текст без словаря. Вовсе не нужно учить это все наизусть. Так странно, когда с тобой так разговаривают. Очень важно, чтобы нас не заметили. Ошибаться легко, гораздо труднее понять свою ошибку. Приятно побывать опять в Киеве. Трудно будет объяснить вам это. Главное – это закончить эксперимент вовремя. Моим единственным желанием было добраться домой поскорей. Единственный выход из положения – это сейчас же все рассказать.

Exercise 5. Use the appropriate form of the Infinitive in brackets.

I am glad (to introduce) to you. The box was (to handle) with care. You should (to ask) someone (to help) you. This might not (to happen). Her mood seems (to change) for the worse. We had better not (to speak) to her now. I am sorry (to disappoint) you but I did not mean anything of the kind. He is happy (to award) the first Prize for his picture. He was anxious (to take) the first place in the figure-skating competition. The poem can easily (to memorize). I did not expect (to ask) this question. There were so many things (to do), so many experiments (to try). The teacher expected him (to give) a better answer at the examination. They are supposed (to experiment) in this field for about a year and are believed (to achieve) good results. He must (to read) something funny; he is smiling all the time.

Exercise 6. Translate the sentences. Note the use of the Infinitive.

To solve the mathematical sentences in the section to follow on must understand the meaning of these symbols. This means that to locate this geometric object one is to start from some arbitrarily selected zero point. This publication must have made his name famous. The types of symbols to be introduced are basic to every number system. To make sure that the result you have obtained does agree with the expected one, check it. To hold the situation under control is rather difficult. Our task has been to realize this plan.

Part 3. Speaking activities. Read, translate and retell the text.
WHILE THE AUTO WAITS

The girl in grey came again to that corner of the park. She sat down on a bench and began reading a book. She had come here at the same hour on the previous day and on the day before that, and there was a young man who knew it. The girl was beautiful and it was no wonder she had attracted the young man's attention.

The young man came nearer. At that moment the girl dropped her book, the young man picked up the book, returned it to the girl saying a few words about the weather and stood waiting. He hoped she would ask him to sit down. The girl looked at him: "You may sit down if you like," she said. "I'm not going to read now, I should like to talk." Then the girl told him that she was tired of her rich life and she wanted to meet a man who was not spoilt by money.

"I always thought," said the young man, "that money is a very good thing." "Oh, you don't know how tired I am of dinners, trips, theatres, suppers. Sometimes I think that if I love a man I shall love a simple man. What are you?" "I am a very simple man. I work at a restaurant over there. I'm a cashier." The girl looked at her watch. "Why are you not at work?" she asked. "Today my work begins late. May I hope to see you again?"

"I don't know. I must go now. Oh, there's a dinner and a concert tonight. Perhaps you saw a white car at the corner of the park when you came?"

"Yes, I did," said the young man. "I always come in it", the girl said, "the driver is waiting for me there. Good night."

And she went away. The young man looked at her while she was going out of the park. When she disappeared round the corner he followed her. The girl left the park, crossed the street and went into the restaurant the young man had spoken of. A woman left the cashier's desk and the girl in grey took her place. It was clear she was a cashier at that restaurant.

The young man left the park, walked down the street as far as the white car. There he stopped, got into the car and said to the driver, "Club, Henry."

(After O'Henry "While the Auto Waits")

Task 1. Answer the questions.

1. Why do you think the girl said that she was rich? 2. Did the girl know whose car was waiting at the corner of the park? 3. Why do you think the young man told the girl that he worked at the restaurant? 4. Did she believe him? Why? 5. Will the young people meet again? Why do you think so? 6. Why is the story called "While the Auto Waits"?

UNIT 7
Part 1. Text 7.   ELEVEN LAWS OF REAL NUMBERS

1.   **THE CLOSURE LAW OF ADDITION.** The sum of any two real numbers is a unique real number. For example, the sum of 10 and 117 is 127.

2.   **THE COMMUTATIVE LAW OF ADDITION.** The order in which we add is trivial. For example, the sum of 3 and 4 is 7; the sum of 4 and 3 is also 7.

3.   **THE ASSOCIATIVE LAW OF ADDITION.**   Since addition is defined for pairs of numbers, the addition of three numbers depends on our first adding any two of the numbers and then adding their sum to the third number; the order in which we do this is trivial. For example, when 3,4 and 5 are added in three different orders, the same sum is obtained:

$$3+4=7, \ 7+5=12$$
$$4+5=9, \ 9+3=12$$
$$3+5=8, \ 8+4=12$$

4.   **THE IDENTITY LAW FOR ADDITION.** The number zero is the additive identity, for the addition of it to any other number leaves the second number unchanged. For example, the sum of 0 and 9 is 9.

5.   **THE INVERSE LAW FOR ADDITION.** The sum of any number and its negative is zero. For example, the sum of 5 and -5 is 0.

6.   **THE CLOUSE LAW FOR MULTIPLICATION.** The product of any two real numbers is a unique real number. For example, the product of 117 and 10 is 1,170.

7.   **THE COMMUTATIVVE LAW OF MULTIPLICATION.** The order is which we multiply is trivial. For example, the product of 3 and 4 is the same as the product of 4 and 3.

8.   **THE ASSOCIATIVE LAW OF MULTIPLICATION.** Since multiplication is defined for pairs of numbers, the multiplication of three numbers depends on our first multiplying two of the numbers and then multiplying their product by the third number; the order in which we do this is trivial. For example:

$$3*4*5=60 \qquad 3*4=12, \ \ 12*5=60$$
$$3*5*4=60 \qquad 3*5=15, \ \ 15*4=60$$
$$4*5*3=60 \qquad 4*5=20 \ \ 20*3=60$$

9.   **THE IDENTITY LAW FOR MULTIPLICATION.** The number one is the multiplicative identity, for the product of it and any other number leaves the second number unchanged. For example, the product of 1 and 8 is 8.

10.   **THE INVERSE LAW FOR MULTIPLICATION.** The product of any number (except zero) and its reciprocal is one. For example, the product of 2 and ½ is 1; the product of 5 and is 1; the product of   and is 1. Division of a number by zero meaningless.

11.   **THE DISTRIBUTIVE LAW.** Multiplication "distributes" across addition. For example:
$6*(4+5)=6*9=54; \quad 6*(4+5)=(6*4)+(6*5)=24+30=54$

Vocabulary:

addition and subtraction – сложение и вычитание

multiplication and division – умножение и деление

the closure law of addition - закон замыкания сложения

the commutative law of addition - переместительный закон сложения

the associative law of addition - сочетательный закон сложения

the identity law for addition – тождество в сложении

the inverse law for addition - закон инверсии в сложении

the closure law for multiplication - закон замыкания в умножениии

the commutative law of multiplication - переместительный закон умножения

the associative law of multiplication - сочетательный закон умножения

the identity law for multiplication – тождество в умножении

the inverse law for multiplication – закон инверсии в умножении

the distributive law - распределительный закон

Table 1:   Basic properties of arithmetic.

a + b = b + a	**Additive commutivity**
a + (b + c) = (a + b) + c	**Additive associativity**
a + 0 = 0 + a = a	**Additive identity**

$a + (-a) = 0$	**Additive inversion**
$ab = ba$	**Multiplicative commutivity**
$(a)(bc) = (ab)(c)$	**Multiplicative associativity**
$(a)(1) = (1)(a) = a$	**Multiplicative identity**
$(a)(1/a) = 1$	**Multiplicative inversion**
$(a)(b + c) = ab + ac$	**Distributivity**

Test 4

1. Properties of addition

Which property of addition is shown? $1 + 9 = 9 + 1$

      A) associative;   B) commutative;   C) identity

Which equation shows the identity property of addition?

A) $(d + g) + h = d + (g + h)$;   B) $g + d = d + g$;   C) $d + g = h$;   D) $0 + d = d$

Which property of addition is shown? $a + (b + c) = (a + b) + c$

   A) Associative;   B) commutative;   C) identity

Which equation shows the commutative property of addition?

A) $s + t = t + s$;   B) $s + 0 = s$;   C) $s + (t + u) = (s + t) + u$;   D) $s + t = t + u$

2. Properties of multiplication

Which equation shows the distributive property of multiplication?

A) $8 \times 7 = 7 \times 8$;   B) $9 + 9 + 9 + 9 = 9 \times 4$;   (C) $(3 + 6) \times 4 = 3 \times 4 + 6 \times 4$;

D) $12 \times 4 = 3 \times 16$

Which equation shows the commutative property of multiplication?

A) $21 + 2 = 3 \times 7 + 2$;   B) $3 \times 4 = 4 + 4 + 4$;   C) $2 \times (7 - 4) = 2 \times 7 - 2 \times 4$;

D) $7 \times 5 = 5 \times 7$

Which equation shows the zero property of multiplication?

 A) $1 \times 8 + 1 \times 3 = 1 \times (8 + 3)$;   B) $4 = 4 \times 1$;   (C) $4 \times 0 = 0$;   D) $21 + 6 = 7 \times 3 + 6$

Which property of multiplication is shown? $6 = 6 \times 1$

A) commutative;   B) identity;   C) zero;   D) distributive

3. Solve for a variable using properties of multiplication

A) What value of h makes this sentence true? $658,589 \times 969,205 = 969,205 \times h$

Hint: Use properties of multiplication to solve without multiplying.

B) Write the missing number:$546,346 \times ($ ___ $\times 45,564) = (546,346 \times 591,471) \times 45,564$

Hint: Use properties of multiplication to solve without multiplying

C) What value of x makes this sentence true? $242,656 = x \times 242,656$

Hint: Use properties of multiplication to solve without multiplying.

Part 2. Grammar: COMPARISON OF ADJECTIVES
FORMING THE COMPARATIVE AND SUPERLATIVE

Number of syllables	Comparative	Superlative
1. one syllable	+ -er	+ -est

tall	taller	tallest

one syllable with the spelling *consonant + single vowel + consonant*: double the final consonant:

fat	fatter	fattest
big	bigger	biggest
sad	sadder	saddest

2. two syllables	**+ -er OR more + adj**	**+ -est OR most + adj**

ending in: *-y, -ly, -ow;*   ending in: *-le, -er or -ure*
these common adjectives - handsome, polite, pleasant, common, quiet

happy	happier/ more happy	happiest/ most happy
yellow	yellower/ more yellow	yellowest/ most yellow
simple	simpler/ more simple	simplest/ most simple
tender	tenderer/ more tender	tenderest/ most tender

If you are not sure, use *MORE +   OR MOST +*
Note: Adjectives ending in *'-y'* like *happy, pretty, busy, sunny, lucky* etc:. replace the *-y* with *-ier* or *-iest* in the comparative and superlative form

busy	*busier*	*busiest*
3. three syllables or more	**more + adj**	**most + adj**
important	more important	most important
expensive	more expensive	most expensive

Examples: A cat is *fast,* a tiger is *faster* but a cheetah is *the fastest.*
A car is *heavy,* a truck is *heavier,* but a train is *the heaviest.*
A park bench is *comfortable,* a restaurant chair is *more comfortable,* but a sofa is the *most comfortable.*

IRREGULAR COMPARATIVES AND SUPERLATIVES

Adjective	Comparative	Superlative
good	better	best
bad	worse	worst
little	less	least
much	more	most
far	further / farther	furthest / farthest

NOT AS + ADJECTIVE + AS

Difference can also be shown by using **not so/as ...as**:
Examples: Mont Blanc is *not as high as* Mount Everest.
Norway is *not as sunny as* Thailand.
A bicycle is *not as expensive as* a car.
Arthur is *not as intelligent as* Albert.

COMPARISONS OF QUANTITY
Table 1. To show **difference:** *more, less, fewer + than*
Examples:

With **countable** nouns: *more / fewer:*

Eloise has *more* children *than* Chantal.
Chantal has *fewer* children *than* Eloise.
There are *fewer* dogs in Cardiff *than* in Bristol
I have visited *fewer* countries *than* my friend has.
He has read *fewer* books *than* she has.

With **uncountable** nouns: *more / less:*

Eloise has *more* money *than* Chantal.
Chantal has *less* money *than* Eloise.
I spend *less* time on homework *than* you do.
Cats drink *less* water *than* dogs.
This new dictionary gives *more* information *than* the old one.

Table 2. To show **no difference**: *as much as , as many as, as few as, as little as*
- *as many as / as few as* + **countable** nouns
- *as much as / as little as* + **uncountable** nouns

Examples:

With **countable nouns**:

They have *as many* children *as* us.
We have *as many* customers *as* them.
Tom has *as few* books *as* Jane.
There are *as few* houses in his village *as* in mine.
You know *as many* people *as* I do.
I have visited the States *as* many times *as* he has

With **uncountable nouns**:

John eats *as much* food *as* Peter.
Jim has *as little* food *as* Sam.
You've heard *as much* news *as* I have.
He's had *as much* success *as* his brother has.
They've got *as little* water *as* we have.

Table 3.

Twice as … as – в два раза больше	Petrol is **twice as** expensive **as** it was last year.
Three times as … as (thrice as … as) – в три раза больше	Their flat is **three times as** big **as** ours.

Table 4.

Half as much/many – в два раза меньше	The students are **half as many as** it was expected.
Half the size – в два раза меньше	The room is **half the size** of theirs.
Half my age – в два раза моложе	You are **half my age.**
Half the weight – два раза легче	My trunk is **half the weight** of yours.
Not so/as … as – не такой…как	He is not **so (as) tall as** his brother.
Much+adj. – намного…	The Dniper is **much longer** than the Thames.
Far more+adj. – гораздо …	This book is **far more interesting** than that one.
A great deal+adj. – значительно …	Your knowledge is **a great deal better** than mine.
A lot+adj. – намного …	
Bit+adj. – немного …	Could you speak **a bit (little) more slowly**?
A little+adj. – немного …	
The longer … the more (etc.) – чем дольше …, тем больше (и т.д.)	**The longer** I know people **the more** they puzzle me.
The more … the better – чем больше …, тем лучше	**The warmer** the weather **the better** I feel.
	What time shall we leave? **The sooner the better.**
The same … as – такой же … как	Ann gets **the same** salary **as** mine**.**
Than(as) me/him/her/them/us – чем я/он/она/ они/мы	You are **more experienced than me (I am).**
	I can drive **as fast as him (as he can).**

Exercise 1. Translate the quotation.
You are as young as your self-confidence. You are as young as your hope.
You are as old as your doubts. You are as old as your fear. You are as old as your despair.

Exercise 2. Use *a bit/ a little/ much/ a lot/ far* before comparatives.

His songs are___ than his operas. (much/famous)
It is ___ in February than in March. (a bit/windy)
I found the museum ___ than I had expected. (far/interesting)
I am ___ today than I was yesterday. (a lot/tired)
I prefer this armchair. It's ___ the other one. (much/comfortable)
This flat is too small for me. I need something ___. (much/big)

Exercise 3. Translate the words in brackets.
This is _____ (самая интересная книга) I have ever read on this subject.
Swimming is _____ (крайне популярный) summer sport.
Shakespeare is _____ (самый выдающийся) English poet and playwright of all the age.
Oil and gas are _____ (крайне важные) natural resources.
He is _____ (весьма умный) student.

Exercise 4. Translate the sentences using the model.
Model: *Чем раньше мы выедем, тем скорее приедем. - The earlier we leave, the sooner we'll arrive.*
Чем дольше он ждал, тем больше он терял терпение. (become impatient)
Чем больше я его узнаю (get to know), тем больше он мне нравится.
Чем больше ты упражняешься в английском (exercise in English), тем быстрее ты выучишь его.
Чем больше товаров вы продаете, тем больше доход. (make profit)
Чем дольше ты говоришь по мобильному телефону, тем более дешевый тариф предоставляется провайдером.(is provided)

Exercise 5. Translate into English.
Киев – более древний город, чем Москва; это один из древнейших городов. В 16 веке Испания была самой могущественной державой мира. Волга длиннее Днепра; это самая длинная река Европы. Ватикан – самое маленькое государство в Европе. Советую вам пойти этой дорогой, это самый короткий путь. Эта проблема не так серьезна, как вам кажется. Реферат должен содержать лишь наиболее важные мысли автора. Язык этой статьи попроще, начните с нее. Купите обои посветлее для вашей комнаты. Она тогда не будет выглядеть такой мрачной, как сейчас.
Я не так молод, как вы, вы в два раза моложе. Чем быстрее мы закончим работу, тем лучше. Это совершенно новый прибор, он может работать в три раза быстрее. Новый аэропорт в три раза больше нашего старого. Этот перевод вдвое легче. Вы с ним справитесь. Сегодня вдвое холодней, чем вчера. Чем меньше ты будешь говорить, тем лучше. К сожалению, я не смог прийти так рано, как обещал. Суп хорошо пахнет, а на вкус он еще лучше.

Part 3. Dictation. ACCIDENT
The lights were red. So the old man stopped his car and waited for them to change to green. While he was waiting at the traffic lights, a police car came up behind at high speed, hit his car hard in the back and stopped. There were two policemen in the police car and they were very glad and surprised when the old man got out of his car and walked towards them without any trouble after such an accident. He was over seventy years old. The old man came up to the door of the police car, opened it, smiled kindly and said, "Tell me young gentlemen, how do you usually stop your car when the lights are red and I am not here?"

UNIT 8
Part 1. Text 8. ISAAK NEWTON

Sir Isaak Newton (1643-1727) was a **brilliant** English **mathematician and physicist**. It is **justly** believed that he is one of the greatest men of science in the history of **mankind.**

Newtonean theory of **universal gravitation** and his formulation of **the basic concepts and principles of mechanics** are known as his two **great achievements.** They have made possible the creation of **a physical picture of the Universe** which **remained unshaken** until the beginning of the 20th century. It is very important for us to examine, in some detail, the **concepts** he **introduced and clarified** in the course of his work.

Ever since Galileo had invented his telescope men had been studying **the motions of the planets** with ever increasing interest and accuracy. In particular, a great deal of **observed data** had been collected by Tycho Brahe, a Danish astronomer (1546-1601). From these Kepler **deduced** his **famous three laws** describing the **motion of the planets about the Sun.** They amounted to:

(1) The planets describe **ellipses**, **with the Sun being at a focus.**

(2) The radius vector joining the Sun with the planet describes equal areas in equal times, i.e. (that is) the **rate** of description of **sectorial area** is constant.

(3) The cubes of the **mean distances** of the planets from the Sun are proportional to the squares of their **times of revolution**, i.e. if *2a* is **the major axis** of the **elliptic orbit** and *t* is the **periodic time**, than we have $t^2 \propto a^3$**.**

Newton was able to show that these laws were **compatible** with **the assumption that** each planet **possesses some acceleration towards** the Sun which is inversely proportional to the square of their distance from it. **Furthermore**, he believed that this acceleration was of the same nature as the acceleration of the bodies falling near **the Earth's surface**. This generalization **led** him **to the concept** that all the bodies taken in pairs, **induce** in each other **mutual acceleration**. Translating this into terms of force required a new principle and Newton supplied this principle in his law of: "action and reaction" – and this in its turn **provides** us **with** a view of mass not **possessed by** any of Newton's **predecessors**. This concept **distinguishes between** mass and weight. The **law of motion** which Newton published in his *Principia* amount to the following:

Law 1. Every body **preserves** in its **state to rest** or of **uniform motion** in a straight line unless it is **compelled to alter** that state by **impressed force.**

Law 2. Change of momentum is proportional to the impressed force and takes place alone the line of action of that force.

Law 3. Action and reaction are always equal and opposite; that is to say, the actions of two bodied upon each other are **equal and directly opposite**.

Text 8.   **ISAAK NEWTON**
Vocabulary:

a brilliant mathematician and physicist – выдающийся математик и физик

justly - справедливо

mankind – человечество

universal gravitation - всемирное тяготение

the basic concepts and principles of mechanics – базовые понятия и принципы механики

great achievements – великие достижения

a physical picture of the Universe – физическая картина Вселенной

remain unshaken – оставаться непоколебимым

concepts - понятие, идея; общее представление; концепция

introduce and clarify concepts - вводить и прояснять понятия

the motions of the planets – движение планет

in particular – в частности

observed data – информация (данные), полученная в ходе научных наблюдений

deduce - сделать вывод; выводить (формулу); **induce -** заставлять, побуждать

amount to - 1. сводиться к, достигать, составлять; 2. равняться, быть эквивалентным

with the Sun being at a focus – с солнцем в фокусе

ellipses - эллипс

theory of universal gravitation – теория всеобщей гравитации

rate – скорость, темп

sectorial area – секториальная область

mutual acceleration – взаимное ускорение

mean – *мат.* середина; средняя величина, среднее число; **mean line** — биссектриса

mean distance – среднее расстояние; **arithmetic mean** — среднее арифметическое;

to find a mean — найти среднее (значение);

times of revolution – время обращения; (здесь) время одного оборота вокруг Солнца

the major axis – главная ось; **elliptic orbit** – эллиптическая орбита

periodic time – период обращения; продолжительность цикла

compatible - совместимый, сочетаемый

the assumption - предположение, допущение

to possess some acceleration towards smth. – обладать некоторым ускорением по напр. (к)

inversely proportional – обратно пропорциональный

the Earth's surface – поверхность Земли

furthermore – более того

lead – led –led - приводить, повлиять

to provide with - предоставить кому-то что-либо

predecessor - предшественник

to distinguish between - различать, распознавать

law of motion – закон движения

preserve – сохранять; **state to rest** – состояние покоя

uniform motion - равномерное движение

compel - заставлять, вынуждать, принуждать; **to alter** - изменять

impressed force – приложенная сила

equal and directly opposite – равный и прямо- противоположный

Task 1. Answer the questions.
1. What are the two great achievements of Isaak Newton? 2. What do you know of the first scientist who collected a great deal of data which later helped to make important discoveries in the motion of the planets? 3.What was Kepler's deduction? 4. What is the acceleration of each planet towards the Sun inversely proportional to? 5. Did Newton's predecessors distinguish between mass and weight? 6. How many laws of motion did Newton formulate?

Task 2. Read the sentences below and say in which ones you can omit the conjunction and why. Translate these sentences.

1. The assumption which he has made is compatible with our understanding of the problem. 2. The alterations which they were planning to make were particularly important. 3. He spoke of the motion which remained constant. 4. The knowledge of astronomy which you have is not enough to distinguish between these two phenomena. 5. He has agreed to speak on that particular subject, which means that he finds it very essential. 6. The weight of the body which has fallen down is easy to determine. 7. The force of gravity which acts on all the bodies on the Earth keeps these bodies on the surface. 8. He spoke of Newton's predecessors which showed that he knew the history of science very well. 9. They discussed the future of mankind which seemed to them quite optimistic. 10. The weight of the body which you are describing is easily determined.

Task 3. Translate the sentences from Russian into English.
1. Первое тело движется равномерно в том же направлении, что и второе тело. 2. Все планеты движутся по определенным орбитам. 3. Это утверждение следует разъяснить. 4. Больное количество вопросов прояснилось в процессе эксперимента. 5. Скорость вращения может быть легко измерена. 6. Падающее тело обладает ускорением. 7. Его вынудили согласиться с этим решением. 8. Программа была выполнена благодаря взаимной помощи. 9. Окончательные результаты были несовместимы с теорией. 10. Среднее расстояние должно быть тщательно рассчитано. 11. Нам следует отличать массу от веса тела. 12. Тебе следует изменить мнение и предоставить нам свободу действий. 13. Более того нас удивило твое противодействие нашему плану.

How to say "0":

nought	**used in mathematical expressions and decimals:** *'**nought** times three equals **nought**'* 0.3 = '**nought** point three' (or 'point three') 0.03 = 'point **nought** three'
zero	**used in scientific expressions, especially temperatures:** -20°C = minus twenty degrees *or* twenty degrees below **zero** **also used to mean 'the lowest point':** 'The heavy rain reduced visibility to **zero**'
'o' (the letter)	**used in telephone numbers:** 0171 390 0062 = '**o** one seven one three nine **o** double **o** six two'
nil/nothing	**used to express the score in games such as football:** 2 - 0 = 'two **nil**' or 'two **nothing**'

Part 2. Grammar: THE ZERO INFINITIVE
The zero infinitive is used:
1. after most auxiliaries (e.g. ***must, can, should, may, might)***
2. after verbs of perception, (e.g. ***see, hear, feel)*** with the pattern ***verb + object + zero infinitive***
3. after the verbs *'make'* and *'let'*, with the pattern ***make/let + object + zero infinitive***
4. after the expression *'had better'*
5. after the expression *'would rather'* when referring to the speaker's **own** actions
 Examples:
1. After auxiliaries: She **can't** *speak* to you. He **should** *give* her some money. **Shall** I *talk* to him? **Would** you *like* a cup of coffee? I **might** *stay* another night in the hotel. They **must** *leave* before 10.00 a.m.
2. After verbs of perception: He **saw** her *fall* from the cliff. We **heard** them *close* the door. They **saw** us *walk* toward the lake. She **felt** the spider *crawl* up her leg.

3. After the verbs 'make' and 'let': Her parents **let** her *stay* out late. **Let's** *go* to the cinema tonight. You **made** me *love* you. Don't **make** me *study* that boring grammar book!

NOTICE that the *'to-infinitive'* is used when *'make'* is in the passive voice:

- I *am made to sweep* the floor every day.
- She *was made to eat* fish even though she hated it.

4. After 'had better': We **had better** *take* some warm clothing. She **had better** *ask* him not to come. You**'d better** *not smile* at a crocodile! We **had better** *reserve* a room in the hotel. You**'d better** *give* me your address. They **had better** *work* harder on their grammar!

"HAD BETTER" - Выражение "had better", стоящее перед инфинитивом смыслового глагола без частицы "to", на русский язык переводится «лучше бы». Такое выражение обычно используется в случаях, когда говорящий высказывает свой совет или мнение в конкретной ситуации.

> ***You had better see a doctor. - Вам лучше бы сходить к врачу.***
> ***I think I had better go home now. – Я думаю будет лучше, если я сейчас пойду домой.***

Заметьте, что обычно используется сокращенная форма ***'d better.*** Запомните, что в предложениях, содержащих данную грамматическую структуру, всегда идет ссылка на будущее время, хотя на первый взгляд может показаться, что раз **'had'** стоит в прошедшем времени, следовательно подразумевается прошедшее время. Рассуждать так не верно.

You'd better notify the police at once. - Вам лучше сразу же уведомить полицию.

You'd better rest for a while. - Вам стоило бы отдохнуть.

I'd better come back later. - Будет лучше, если я приду позже.

They'd better spend more time on their homework. - Им бы лучше проводить больше времени над домашними заданиями.

В отрицаниях отрицательная частица "not" ставится после структуры "had better"

I'd better not look at this. - Я лучше не буду на это смотреть.

He'd better not spend a lot of money. - Будет лучше, если он не потратит много денег.

Структура"had better" по способу выражения совета или мнения мягче, чем модальные глаголы: "must", "should", "have to".

Part 3. Speaking activities. Read and memorize the stories
They'd better be prepared.

1. Gloria didn't do well at a job interview yesterday. She didn't get the job, and she realizes that at the interview today she'd better do a few things differently.

She'd better speak confidently, she'd better tell more about her previous experience, and she'd better wear conservative clothes.

In addition, she'd better not arrive late for the interview. She'd better not smoke in the interviewer's office. And she definitely had better not ask too many questions about vacations and sick days. Gloria will certainly do things differently this time.

2. Arthur didn't do well at a tennis tournament yesterday. He didn't win, and he realizes that at the tournament next week he'd better do a few things differently.

He'd better practice more during the week, he'd better do more warm-up exercises before the tournament, and he'd better get a good night's sleep the night before.

Furthermore, he'd better not use his old tennis racket. He'd better not eat a large breakfast that morning. And he definitely had better not go our dancing with his friends the night before. Arthur will certainly do a few things differently nest time.

UNIT 9
## Part 1. Text 9.   CIRCUMFERENCE OF A CIRCLE

A **circle** is a shape with all points having the same distance from the **center**. It is named by the center. The circle to the left is called circle A since the center is at **point** A. If you measure the distance around a circle and divide it by the distance across the circle through the center, you will always come close to a particular value, depending upon the **accuracy of your measurement**. This value is **approximately** 3.14159265358979323846... We use the Greek letter π *(pronounced Pi)* to represent this value. The number π goes on forever. However, using computers, mathematicians have been able to calculate the value of π to thousands of places.

The distance around a circle is called the **circumference**. The distance across a circle through the center is called the **diameter**. π is the ratio of the circumference of a circle to the diameter. Thus, for any circle, if you divide the circumference by the diameter, you get a value close to π. This relationship is expressed in the following formula: $\pi = \frac{C}{d}$, where C is circumference and d is diameter. You can test this formula at home with a round dinner plate. If you measure the circumference and the diameter of the plate and then divide C by d, your quotient should come close to π. Another way to write this formula is: $C = \pi \cdot d$. This second formula is commonly used in problems where the diameter is given and the circumference is not known (see the examples below).
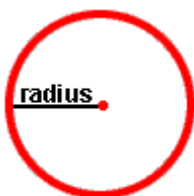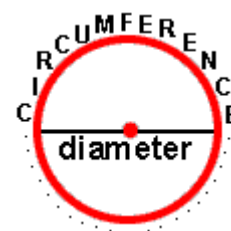
The **radius** of a circle is the distance from the center of a circle to any point on the circle. If you place two radii end-to-end in a circle, you would have the same length as one diameter. Thus, the diameter of a circle is twice as long as the radius. This relationship is expressed in the following formula: $d = 2 \cdot r$, where d is the diameter and r is the radius.

Circumference, diameter and radii are measured in linear units, such as inches and centimeters. A circle has many different radii and many different diameters, each passing through the center. A real-life example of a radius is the spoke of a bicycle wheel. A 9-inch pizza is an example of a diameter: when one makes the first cut to slice a round pizza pie in half, this cut is the diameter of the pizza. So a 9-inch pizza has a 9-inch diameter. Let's look at some examples of finding the circumference of a circle. In these examples, we will use $\pi = 3.14$ to simplify our calculations.
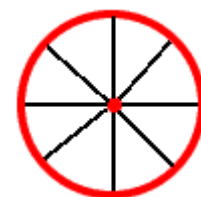
Task 1: Look through the solutions of these tasks and make up your own tasks for your group mates.
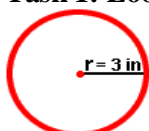
Example 1: The radius of a circle is 3 inches. What is the area?
Solution: $A = \pi \cdot r \cdot r$ $A = 3.14 \cdot (3 \text{ in}) \cdot (3 \text{ in})$ $A = 3.14 \cdot (9 \text{ in}^2)$ $A = 28.26 \text{ in}^2$
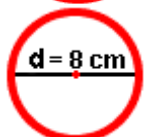
Example 2: The diameter of a circle is 8 centimeters. What is the area?
Solution: $d = 2 \cdot r$ $A = \pi \cdot r \cdot r$
8 cm = 2 $\cdot r$ $A = 3.14 \cdot (4 \text{ cm}) \cdot (4 \text{ cm})$
8 cm $\div$ 2 = r $r = 4$ cm $A = 50.24 \text{ cm}^2$

Part 2. Grammar: THE USE OF THE OBJECTIVE INFINITIVE CONSTRUCTION

The Objective-with-the-Infinitive Construction is used:

1. After verbs denoting **sense perception**, such as: **"to hear", "to see", "to watch", "to feel", "to observe", "to notice"**, etc. without particle **to:**

I haven't heard anyone call me. - Я не слышал, чтобы кто-нибудь меня звал.

I saw David enter the room. - И видел, как Давид вошел в комнату.

After verbs of sense perception only the Indefinite Infinitive Active is used. If the meaning is passive, Participle II is used:

Он слышал, как его имя упомянули. - He heard his name mentioned.

If a process is expressed, Participle I Indefinite Active is used:

He saw Wendy coming - Он увидел, как Венди идет.

It should be noted that the verb **"to see"** should be followed by a clause and not by the Objective-with-the-Infinitive Construction, when it is used in the meaning of **"to understand".**

I **saw** that he did not realize the danger. - Я **видел (т.е. понимал)**, что он не осознает опасности.

After the verbs **"to see"** and **"to notice"** the Objective-with-the-Infinitive Construction is not used with the verb "to be". In such cases Subordinate Clause is used:

I saw that he was pale. - Я видел, что он побледнел.

When the verb **"to hear"** is not a verb of sense perception and is used in the meaning **"to learn", "to be told"**, a clause or a gerund is used, but not the Objective-with-the-Infinitive Construction.

I heard that he had left for France. - Я слышал (Мне сказали), что он уехал во Францию.

We have heard that she has found a job. - Мы узнали, что она нашла работу.

2. After verbs denoting **mental activity**, such as: **"to know", "to think", "to consider", "to believe", "to suppose", "to expect", "to imagine", "to find", "to trust", "to suggest" and etc.** particle **to** is used. After verbs of mental activity in the Objective-with-the-Infinitive Construction the verb "to be" is generally used. But this restriction does not apply to the verb "to expect". The use of this construction after most verbs of mental activity is more characteristic of literary than of colloquial style.

I know you to be the most honest, spotless creature that ever lived. - Я знаю, что Вы самое честное и безупречное существо из всех, когда-либо живших на свете.

If you suppose that boy to be friendless, you deceive yourself. - Если вы предполагаете, что у этого мальчика нет друзей, вы ошибаетесь.

Everybody expected her to marry Pete. - Все ожидали, что она выйдет замуж за Пита.

After verbs of mental activity the Perfect Infinitive is used, but seldom.

The doctor found his heart to have stopped two hours before. - Доктор установил, что его сердце перестало биться два часа тому назад.

In the Objective-with-the-Infinitive Construction after verbs "**to think", "to consider", "to find"**, the verb "to be" is left out.

For instance, instead of "I consider him to be a good specialist" we can say "I consider him a good specialist" and translate into Russian literally "Я считаю его хорошим специалистом". (This sentence is translated by simple sentence.)

3. After verbs of **declaring: "to pronounce", "to declare", "to report"** particle **to** is used.

The surgeon pronounced the wound to be a slight one. - Врач сказал, что рана легкая.

She declared him to be the most disobedient child in existence. - Она заявила, что это самый непослушный ребенок на свете.

4. After verbs denoting **wish** and **intention: "to want", "to wish", "to desire", "to mean", "to intend", "to choose"** (in the meaning "хотеть") and also after the construction **"I would like"** (Я хотел бы) with particle **to.**

He intended me to go with him to India. - Он хотел, чтобы я поехала с ним в Индию.

I want you to come and dine with me. - Я хочу, чтобы вы пришли со мной пообедать.

I don't choose you to go by yourself to a hotel. - Я не хочу, чтобы вы жили в гостинице одна.

I would like her to look through my report. - Я бы хотел, чтобы она просмотрела мой доклад.

5. After verbs and expressions denoting **feeling** and **emotion**: **"to like", "to dislike", "to love", "to hate", "cannot bear", etc.** with particle **to.**

I dislike you to talk like that. - Я не люблю, когда ты так говоришь.

I hate him to be flogged. - Я терпеть не могу, когда его бьют.

I cannot bear you to speak of that. - Я не могу выносить, когда вы говорите об этом.

6. After verbs denoting **order and permission: "to order", "to allow", "to suffer" etc.** with **to.**
Here we find the Objective-with-the-Infinitive only if the object is expressed by a noun or pronoun, denoting lifeless thing or when the Infinitive is passive. This restriction does not apply to the verbs "to suffer" and "to have".

Mr. Sinclair ordered his carriage to be ready early in the morning. - Мистер Синклер распорядился, чтобы экипаж был готов рано утром.

She had never allowed the name to John Gordon to pass her lips. - Она никогда не позволяла себе произносить имя Джона Гордона. This sentence is translated by simple sentence.

He ordered the wounded to be carried away from the field of battle. - Он приказал, чтобы раненного унесли с поля боя.

However, if the noun or pronoun denotes a person and it is followed by an inactive form as a rule the Infinitive is not a part of the Complex Object and has the function of second Direct Object, immediately subordinated to the Verb.

He ordered the prisoners to go away. - Он приказал пленным (заключенным) уйти.

This sentence is translated by simple sentence.

7. The Objective-with-the-Infinitive Construction is used after verbs denoting **compulsion:**

7.1. "to make" (in the meaning "заставить"), "to let" ("позволить"), "to have" ("заставить","сказать чтобы") without particle **to:**

Light steps in the gravel made him turn his head. - Легкие шаги по гравию заставили его повернуть голову. (This sentence is translated by simple sentence.)

7.2. "to get" ("убедить"), "to cause" ("заставить", "распорядиться") with particle **to:**

She caused a telegram to be sent to him. - Она распорядилась, чтобы ему послали телеграмму.

The noise caused her to awake. - От шума она проснулась.

I cannot get her to finish her lessons. - Я не могу заставить ее закончить уроки.

Exercise 1. Translate the sentences and note the form and the function of the Infinitive.
We consider these two phenomena to be of the same origin. I expect this law to hold for all similar cases. We understand this method to consist of several steps. They wanted us to establish a certain correspondence between these two facts. We assume the program to have been carefully developed. We suppose the particles to be generated at very high speed. We expect this sentence to be true. We know mathematics to have become man's second language. We expect a variable or a mathematical expression containing a variable to represent a number. We know two numbers to be relatively prime to each other if their greatest common factor is 1. We expect this solution to satisfy the given statement. Professor wants his students to attend classes regularly. The students saw their instructor draw (drawing) a line segment. We heard them discuss (discussing) similar questions. Professor wanted his postgraduate students to take part in his research.

For a proper correspondence between these phenomena to be established they first have to be considered separately. For correct conclusions to be drawn all the conditions must be observed. It was impossible for the process to continue. I wonder if it is necessary for them to come. For you to begin the work now is very important. For the problem to be understood it must be read carefully.

Exercise 2. In the following sentences replace the Object Clause with the Complex Object.
Model: I expect *that the article will be written*. – I expect *the article to be written*.

I expect that these rules will be observed. I know that this work is of great importance. He expects that the situation will be analysed carefully. We believe that the machine has certain advantages. I thought she was ready. He expected that I knew the solution. We found that they were interested in the problem. I expect that she will understand me. We expected that he had completed the experiment. I knew that you had obtained similar results. I believed that they had closely cooperated

with you. We found that she had studied the material properly. I suppose that he is involved in this discussion. I assume that they have applied the previously obtained data.

Exercise 3. Ask general questions following the model. Replace the nouns with pronouns.
Model: We expect *the students* to learn the material. - Do you expect *them* to learn the material?
We expect *the scientists* to establish an appropriate pattern. He expects *the student* to speak on the coordinate system. The students wanted *their tutor* to speak on number relations. We found *these statements* to be mathematically incorrect. I believe *this result* to be of some importance.

Exercise 4. Replace the Object Clause with the Complex Object. See the models.
        Model: I want to label this number line with X. (he)
              I want him to label this number line with X.
We expect to locate this distant object in the sky (she). I should like to draw both of the axes (he). He expects to speak about the importance of coordinating our research (they). I should like to interpret these facts correctly (he).

Exercise 5. Translate the sentences from Russian into English.
Я хотел бы, чтобы вы объяснили мне эту задачу еще раз. Никто не ожидал, что они уедут так скоро. Они не видели, как менеджер вошел в офис. Вы слышали когда-нибудь, как он играет на гитаре? Хочет ли он, чтобы мы помогли ему решить это уравнение? Он сказал мне, что видел, как она вышла из дому. Я не ожидал, что меня пошлют в командировку в Лондон. Я знаю, что он опытный программист. Мы ожидаем, что они обнаружат ошибку в программе. Мы полагаем, что преимущества нового метода расчета очевидны. Она чувствовала, как дрожат ее руки. Я считаю, что он нечестный человек. Мы ожидаем, что представитель французской фирмы приедет на днях. Я хочу, чтобы ты прекратил волноваться. Мы хотим, чтобы ты объяснил нам свое поведение. Я знал, что директор в Москве. Мы считаем его большим специалистом в этой области. Мы не ожидали, что обсуждение будет таким интересным. Я видел, что она не понимает меня. Я ожидаю, что меня пригласят на работу в американскую компанию. Я слышал, как его имя было упомянуто начальником отдела исследований и развития. Я не люблю, когда мне напоминают несколько раз об одном и том же. Я видел, как такси остановилось у нашего дома. Я не хотел, чтобы его приглашали на вечеринку. Я слышал, как профессор упомянул об этих фактах в своей лекции. Мы наблюдали, как ремонтировали дорогу. Он посторонился, чтобы дать ей пройти. Я велел ему объяснить, что это значит. Не заставляй меня лгать. Распорядитесь, чтобы секретарь принес все необходимые документы. Не смешите меня. Дайте мне знать, когда они приедут. Позвольте мне помочь вам.

Part 3. Dictation.   A CIGAR

Mr. Dickson felt very bad. One of his friends recommended him doctor Hill who always gave his patients good advice. So Mr. Dickson made arrangements to see the doctor the next day.

When Dr. Hill had examined Mr. Dickson, he told him to go to a village and stay there not less that a month. He also recommended him to go to bed early, drink milk, eat a lot of vegetables and meat and to smoke only one cigar a day. "If you take my advice," said the doctor, "you will soon feel as well as before."

Mr. Dickson looked a little surprised when he heard the doctor's advice, but the doctor did not notice it and though Mr. Dickson was about to ask him something he called the next patient.

A month later Mr. Dickson came to doctor Hill again. "How are you?" the doctor asked him. "You look better now. Did my advice help you?"

"Thank you," said Mr. Dickson, "I did all you had recommended me to do I went to the country, I ate a lot of meat and vegetables but one cigar a day nearly killed me. You see it is impossible to begin smoking at my age."

UNIT 10
Part 1. Text 10:   ALBERT EINSTEIN
Read the following text. It contains some international words whose meaning you may try to guess. After you have read it, write a plan of the text in the form of questions. Then get ready to give a short outline of the text.

Albert Einstein was born in Germany in 1879. His usual talent for mathematics and physics began to show when he was a student at a technical school in Zurich. At the age of 21, after four years of study at the university, he began to work as a clerk at an office. And in 1905 he made some revolutionary discoveries in science. He published three papers. In his first paper he explained the photoelectric effect with the help of M. Plank's quantum theory. His second paper was a mathematical development of the theory of Brownian motion. His third paper was about the "Special Theory of Relativity". It must be mentioned that a great contribution to the theory of relativity had been made earlier by the great mathematician Lorentz and Poincare. Einstein's work was published in a physical journal. It stated that energy equals mass multiplied by the square of the speed of light. This theory is expressed by the equation: $E = mc^2$. Scientists all over the world met this Einstein's work with interest and surprise. But very few physicists realized the importance of his theory at that time.

Another of Einstein's great discoveries was his unified field theory. It was the result of 35 years of intensive research work. He expressed it in four equations where he combined the physical laws that control forces of light and energy with the mysterious force of gravitation.

Albert Einstein gave all his life to science. He was an extremely talented man and a great thinker. He was always looking at the world around him with his eyes wide open and he was always asking: "Why? Why is that so?"

His ideas made a revolution in natural sciences of the 20th century.

Part 3. Practical work:
Text.   Einstein's Chauffeur
This is a true life anecdote about Albert Einstein, and his **theory of relativity**.
Put the proper words into the gaps:

snooze - дремота, сонное состояние; короткий сон (днем)

calculations - вычисления; подсчёты, расчёты

attend -   посещать; присутствовать (на лекциях)

chauffeur - 1. водитель, шофер; 2. возить (кого-л.) на автомобиле

deliver - официально вручать, передавать

delivering – произносящий; to deliver a lecture — читать лекцию

to deliver oneself of a speech — произнести речь

lecture on Relativity - лекция по теории относительности;

to ask a question on the theory of relativity – задать вопрос по теории относительности

place – 1. место; 2**.** должность; **out of place** - неуместный

opportunity - шанс, возможность; перспектива; альтернатива

perfection 1.законченность, завершенность; 2.безупречность, совершенность

row - ряд (в театре, кинотеатре и т. п.); first rows - первые ряды; back rows of the cinema - последние ряды кинотеатра; **just** – как раз

accompanied - сопровождаемый; **vehicle -** транспортное средство

After having proposed his **famous** theory, Albert Einstein would tour the various Universities in the United States, _____lectures wherever he went. He was always _____by his faithful chauffeur, Harry, who would _____ each of these **lectures** while seated in the back _____. One fine day, after Einstein had finished a lecture and was coming out of the lecture theatre into his _____, Harry **addresses** him and says, "Professor Einstein, I've heard your lecture on Relativity so many times, that if I were ever given the _____, I would be able to deliver it to_____ myself!"

"Very well,"replied Einstein, "I'm going to Dartmouth next week. They don't know me there. You can _____the lecture as Einstein, and I'll take your_____ as Harry!"

And so it went to be... Harry **delivered the lecture** to **perfection**, without a word_____ of place, while Einstein sat in the back row **playing** "chauffeur", and enjoying a _____for a change.

_____ as Harry was descending from the podium, however, one of the **research** assistants stopped him, and began to ask him a question_____ the theory of relativity.... one that involved a lot of complex_____ and equations. Harry replied to the assistant, "The answer to this question is very simple! In fact, it's so simple, that I'm going to let my_____ answer it!"

Exercise 1. Find the words in the text that mean:

1. excellence	5. speech made to teach smb.
2. teach	6. investigate, study, explore
3. act	7. talk to someone
4. celebrated, legendary, well-known	8. hypothesis, proposition

Exercise 2. True or false:
1. The chauffeur knows a lot about the theory of relativity.
2. A podium is a small raised area for a performer, speaker, or musical conductor to stand on.
3. The word "equation" comes from the word "equal".
4. If you do something to perfection it means that there aren't many mistakes.
5. If you are involved in something that doesn't mean that you are part of it.
6. The chauffeur is an intelligent person.

Exercise 3. Use the Past Perfect tense – the past activity that happened before another past activity.
1. The man _____ (be dead) when they arrived.
2. The man _____ (die) when they arrived.
3. I _____(get) up and then I brushed my teeth.
4. I couldn't remember where I _____(see) him before.
5. When Mum _____(come) home we _____(already go) to bed.
6. She told me she _____(never see) that man in her life.
7. If only I ____(listen) to him! His advice to send the company was totally wrong.
8. If only I _____ (not like) sweets, it would be so much easier to lose weight.
9. When they found the lost baby they realized she _____(not eat) for days.
10. I couldn't eat anything because I _____ (already had) dinner.

Exercise 4. Choose the correct word:

1. (**IF / UNLESS**) you are careful on the internet, you (**WILL LOSE / WOULD LOOSE**) all the files.

2. Mr. Bell (**DISCOVERED / INVENTED**) the telephone.

3. I'm sorry I'm late, but I (**MISSED / LOST / 'VE MISSED / VE' LOST**) my plane.

4. The (**SPECTATORS / AUDIENCE / VISITORS**) clapped for 5 minutes after the concert yesterday.

5. My car broke (**DOWN / UP / OFF**), so I (**MUST / HAD TO**) call a taxi.

6. We've (**RUN OUT OF / RUN UP OF**) sugar. (**COULD / MAY**) you go to the store and get (**SOME / ANY**)?

7. My alarm clock didn't go (**ON / OFF SO / BECAUSE**) I was late for (**THE WORK / WORK / THE JOB**).

8. I studied for the exam, (**HOWEVER / ALTHOUGH / AND**) I didn't (**PAST / PASSED / PASS**).

9. He isn't good (**IN / AT**) German, but he speaks Japanese (**PERFECTLLY / PERFECT / TO PERFECTION**).

10. It's not (**NATURAL / NATURALLY**) to see that (**NONE / NO ONE**) of the students knows (**ANYTHING / NOTHING**).

11. I don't want to (**DO / HAVE NOTHING / ANYTHING**) with you, and I (**WON'T / WANT**) answer (**ANY / NO**) of your questions.

Exercise 5. Make up passives:
1. They print newspapers every day.
2. He built this house last month.
3. They have killed 15 hostages since February.
4. They can't do anything to help him now.
5. She will take her children to school tomorrow.
6. They are printing the latest issue of "The Times".
7. If you don't do the job properly the boss will fire you.
8. They must keep all the infected people in quarantine.

Exercise 6. Make up reported sentences:
1. "Be quiet and don't move!"
2. "I don't want to hear another word"
3. "It's extremely difficult to do this."
4. "I didn't see him yesterday"
5. "I will do this later"
6. "I'm going to lend you some money"
7. "If you don't tell the truth they'll kill you."
8. "I have to go now, it's really late."

UNIT 11
Part 1. Text 1: MODELS

The knowledge and understanding that the scientist has about the world is often represented in the form of models. The **scientific method** is basically one of **creating, verifying, and modifying models** of the world. The goal of the scientific method is **to simplify** and explain the **complexity and confusion** of the world. The applied scientist and technologist then use the models of science **to predict** and **control** the world. It is important, therefore, that students understand both the reasoning behind the models, and their application in the world.

DEFINITION OF A MODEL

A model is a representation containing the essential structure of some object or event in the real world. The representation may take two major forms:

1) **Physical**, as in a model airplane or architect's model of a building or

2) **Symbolic**, as in a natural language, a computer program, or a set of mathematical equations. In either form, certain characteristics are present by the nature of the definition of a model.

CHARACTERISTICS OF MODELS

1. Models are necessarily incomplete. Because it is a representation, no model includes every aspect of the real world. If it did, it would no longer be a model. In order to create a model, a scientist must first **make some assumptions** about the **essential structure and relationships** of **objects and/or events** in the real world. These assumptions are about what is necessary or important **to explain the phenomena**.

For example, a behavioral scientist might wish to model the time it takes a rat to run a maze. In creating the model the scientist might include such factors as how hungry the rat was, how often the rat had previously run the maze, and the activity level of the rat during the previous day. The model-builder would also have to decide how these factors interacted when constructing the model. The scientist does not **assume** that only factors included in the model **affect the behavior**. Other factors might be the **time-of-day**, the experimenter who ran the rat, and the intelligence of the rat. The scientist might assume that these are not part of the "essential structure" of the time it takes a rat to run a maze. All the factors that are not included in the model will contribute to error in the **predictions of the model**.

2. The model may be changed or manipulated with relative ease.

To be useful it must be easier **to manipulate** the model than the real world. The scientist or technician changes the model and **observes the result**, rather than doing a similar operation in the real world. He or she does this because it is simpler, more convenient, and/or the results might be catastrophic.

A race car designer, for example, might build a small model of a new design and test the model in a wind tunnel. Depending upon the results, the designer can then modify the model and retest the design. This process is much easier than building a complete car for every new design. The **usefulness of this technique**, however, depends on whether the essential structure of the wind resistance of the design was captured by the wind tunnel model.

Changing **symbolic models** is generally much easier than changing **physical models**. All that is required is rewriting the model using different symbols. Determining the effects of such models is not always so easily **accomplished**. In fact, much of the discipline of mathematics is concerned with the effects of symbolic manipulation.

If the race car designer was able to capture the essential structure of the wind resistance of the design with a mathematical model or computer program, he or she would not have to build a physical model every time a new design was to be tested. All that would be required would be the substitution of different numbers or symbols into the mathematical model or computer program. As before, to be useful the model must **capture** the essential structure of the wind resistance.

The values, which may be changed in a model to create different models, are called **parameters**. In physical models, parameters are physical things. In the race car example, the designer might **vary** the length, **degree of curvature**, or weight distribution of the model. In symbolic models parameters are represented by symbols. For example, in mathematical models parameters are most often represented by variables. Changes in the numbers **assigned** to the variables change the model.

Vocabulary:
scientific method – научный метод
creating, verifying, and modifying model – креативная, контролирующая, модифицированная модель
to simplify - упростить
complexity and confusion – сложность и путаница
to predict - предсказывать, прогнозировать
to control - регулировать, контролировать, проверять
physical model – физическая модель
symbolic models – символическая модель
to explain the phenomena – объяснять явления
essential structure – важнейшая, основная структура
object and event – объект и событие
make some assumption – делать предположение
assume - допускать, предполагать; let us assume that... — допустим, что...
affect the behavior - оказывать влияние на поведение
time-of-day - время дня
prediction of the model – предварительная подготовка модели
to observe the results - вести научные наблюдения результатов
to manipulate - воздействовать, влиять
accomplished - законченный, полный, завершенный
usefulness of this technique – применимость методики, пригодность техники
to capture - фиксировать, записывать
parameter - параметр, коэффициент, характеристика; фактор
to vary - изменять(ся), менять(ся); **to vary directly (inversely)** — изменяться прямо (обратно) пропорционально; **to vary with** — меняться в зависимости от чего-л.
degree of curvature – степень искривления
assigned - заданный; назначенный
to assign a value to the variable — приписать значение переменной

Part 2. Grammar: The Subjective-with-the-Infinitive Construction
(The Nominative-with-the-Infinitive Construction)

The Subjective-with-the-Infinitive Construction traditionally called the Nominative-with-the-Infinitive Construction is a construction in which the Infinitive is in predicate relation to a noun in the common case or pronoun in the nominative case.

The peculiarity of this construction is that it does not serve as one part of the sentence. One of its component parts has the function of the subject, the other forms part of a compound verbal predicate. *Jane **is said to resemble** me. - Говорят, что Джейн похожа на меня.*

1. The Subjective-with-the-Infinitive Construction is used with the following groups of verbs **in the Passive Voice: to say -** говорить, **to state -** заявлять, **to report -** сообщать, **to announce -** объявлять, **to believe -** полагать, **to suppose, to suggest -** предполагать, **to think - думать, to expect -** ожидать, **to know -** знать, **to understand** – в значении узнавать, иметь сведения, **to consider -** считать, **to see -** видеть, **to hear -** слышать, **to order -** приказывать, **to request -** просить, **to allow, to permit -** разрешать, **to make, to cause, to force** – заставлять: *They are believed **to be on** their way to Kiev. **They** were ordered **to leave** the hall.*
> *I was supposed **to meet** him.   **He** was thought **to have gone**.*
> *The delegation **is reported to have arrived** in Peking.*

2. The Subjective Infinitive Construction is used with the following pairs of verb-synonyms in **the Active Voice**:

to seem and **to appear** – казаться	The weather **appears** to be improving.
	She **seemed** to be thinking about something.
to prove and **to turn out** – оказаться	He **proved** to be a good worker.
to happen and **to chance** – случаться	Her mother **had chance**d to look into her room.

3. The Subject Infinitive Construction is used with the word-groups **in the Active Voice:**

to be likely – вероятно, очевидно**; to be unlikely -** маловероятно**; to be sure** – наверняка, без сомнения**; to be certain -** несомненно**.**

*He is sure **to ring** you **up**.   **The goods** are unlikely **to arrive** at the end of the week.*
*They are likely **to be late**.   **They** are certain **to return** soon.*

1. The Indefinite Infinitive with the Subjective-with-the-Infinitive Construction:

a) can refer to a **future action (действие в будущем времени)** with the verbs and word groups whose meaning allows of it: "to expect", "to be sure", "to be certain", and "to be likely".

We are sure **to come** at the heart of the matter. - Мы обязательно доберемся до сути дела.

He is expected **to give** us an answer tomorrow. - Ожидают, что он даст нам ответ завтра.

This fire is certain **to produce** a panic in the morning. - Этот пожар, бесспорно (несомненно) вызовет утром панику.

b) can express the **action simultaneous** with the action of the finite verb

(может выражать действие, одновременное с действием глагола в личной форме):
> *She is said **to live** in Odessa. **He** was said **to know** several oriental languages.*

2. The Continuous Infinitive within the Subjective Infinitive Construction (SIC) refers to a prolonged action (длительное действие): *He is reported **to be writing** a new novel.*
> *The water seems **to be boiling**.*

3. The Perfect Infinitive within the SIC expresses the action which is previous to the action of the finite verb (выражает действие, предшествующее действию глагола в личной форме):
> *He is said **to have been appointed** as a managing director of this big company.*
> *The passenger liner is known **to have left** Odessa-port on the 2ⁿᵈ of May.*

4. The Perfect Continuous Infinitive within the Subjective Infinitive Construction shows the prolonged action which is previous to the action of the finite verb (выражает длительное действие, совершавшееся в течение отрезка времени, предшествовавшего действию глагола в личной форме): *He was said **to have been travelling** about the country a good deal.*
> *The goods are reported **to have been awaiting** shipment for several days.*

Part 3. Practical work.
Exercise 1. Name the Complex Subject and the predicate in every sentence.
Scientists are sure to find a reliable method of detecting errors. The hypothesis proved to be based on the wrong assumption. All the circumstances do not seem to have been properly observed. Certain mistakes appear to have occurred. A proper interpretation of this fact is likely to be obtained. The equipment we were interested in happened to be produced on the line at this factory. Only a century ago the atom was believed to be indivisible. The operator is sure to find errors in the program presented. This question is sure to arise. The computation is expected to have been carried out. Such a mistake is unlikely to have remained unnoticed. This major occasion is known to have caused a lot of argument. This phenomenon does not seem to obey the general law. This solution is believed to be obviously absurd. The preparatory work proved to be very slow and difficult.

Exercise 2. Change the sentences according to the model.
> **Model:** It *is believed* that *he* is a reliable business partner.
> *He is believed to be* a reliable business partner.

It is expected that they will detect the error. It is believed that he is very accurate in making calculations. It is known that they have foreseen all the possible mistakes. It is likely that he has given them explicit instructions. It is unlikely that they have supplied this lab with such complex equipment. It appears that they are unable to account for this absurd situation. It seems that he is an intelligent researcher. It happened so that the error was quickly detected.

Exercise 3. Translate from Russian into English.
Предполагают, что студент знает этот математический закон. Этот подход, полагают, даст определенные преимущества. Кажется, он изменил свою точку зрения. Кажется, этот факт уже объяснили соответствующим образом. Вычисление оказалось очень сложным. Так случилось, что мой преподаватель прочел эту статью. Имеются сведения, что они согласны с нашей теорией. Этот принцип оказался противоположен принципу, приведенному выше в этом исследовании. Можно предположить, что каждая дробь представляет собой частное ее числителя и знаменателя. Эти законы применимы ко всем видам экспонента: положительного и отрицательного, дробного и целого. Ожидают, что они обнаружат и устранят эту ошибку в ближайшем будущем. Полагают, что он очень точен в расчетах. Известно, что этот ученный предвидел возможные ошибки.

Exercise 4. Translate from Russian into English.
Оказывается, они не могут объяснить эту абсурдную ситуацию. Известно, что здание университета было построено 150 лет назад. Кажется, что он опытный работник. Так случилось, что компьютер был заражен вирусом, и вся информация была уничтожена. Он, по-видимому, удовлетворен результатом своей работы. Она, кажется, знает этот предмет очень хорошо. Он оказался хорошим программистом. Эта задача оказалась очень сложной. Известно, что он придерживается другого мнения по этому вопросу. Ожидают, что договор будет подписан украинскими и российскими представителями послезавтра. Считают, что он один из лучших математиков нашего университета. Вряд ли он примет участие в этой научной работе. Он, видимо, устал. Говорят, что переговоры в Верховной Раде Украины уже завершены. Они, без сомнения, забыли о своем обещании. Я случайно зашел в ваш офис, когда твой начальник просматривал все резюме. Это соглашение, вероятно, будет заключено в ближайшем будущем. Погода, вероятно, изменится. Он, наверняка, придет вовремя. Они, безусловно, согласятся принять участие в международной конференции. Документы, наверное, будут отправлены без опоздания. Лекция, без сомнения, будет интересной. Оказалось, что твоя мама права. Заместитель директора, вероятно, вернется на следующей неделе. Представители обеих сторон, оказывается, готовы вести переговоры по этому вопросу. Их план, похоже, не будет обсуждаться на совете директоров во вторник. Сообщают, что пираты получили выкуп и команда этого судна прибудет в Одессу на Рождество. Этот вопрос, наверное, не будут обсуждать в прессе. Вряд ли они прибудут к

концу недели. Маловероятно, что городские власти готовы потратить большие средства на ремонт дорог. Очень вероятно, что они используют традиционные методы для решения этой задачи. Эти факты, едва ли, объяснят нам реальное положение дел в правительстве. Ожидали, что члены комиссии придут к соглашению. Сообщали, что делегация выехала.

Dictation.   **THE SENSE OF HUMOUR**

This story happened some years ago in one of the English Universities. Professor Thompson didn't feel well enough so he was unable to give his lectures that day. That is why he placed a notice on the auditorium door which read us follows: ***"Pf. Thompson won't be able to meet his classes today."*** There was a crowd of students near the door. One student seeing his chance to display his sense of humour came up, smiled spitefully and erased the letter ***"c"*** in word ***"classes"***.

Pf. Thompson noticed the laugher, wheeled around, looked at the student then at his note with letter ***"c"*** erased. A second later our professor came up to the door and calmly erased letter ***"l"*** in the word ***"lasses"***, looked at the student again and proceeded his way. A second pause, the student standing with a dropped jaw and a burst of laughter were the end of this story.

to be unable to do smth. – быть не в состоянии сделать что-то
to display sense of humour – продемонстрировать чувство юмора
to laugh – смеяться; рассмеяться
laugher - зубоскал, насмешник
laughter - смех, хохот
classes (pl.) - группы (в колледже, университете)
lasses (pl.) – девушки, любовницы
asses (pl.) - ослы

3.1. Communicative skills. Colloquial speech.

Read the dialogue and draw your attention to the lexical and grammatical transformations in spoken language.

Jennifer: You up for a movie tonight?   – У тебя нет настроения для похода в кино?
Sally: O dunno. I'm kinda tired.   – Даже и не знаю. Я так устала.
Jennifer: We could take in an early show. Say   – Мы можем пойти на ранний сеанс.
6 o'clock.   Предположим в 6 часов.
Sally: Okay.   - Хорошо.

Новые выражения:
Be up for (something) – интересоваться чем-либо, иметь настроение для чего-либо
Take in (something) – пойти смотреть кино, пьесу, т.д.
Say…? – используется для предположения (когда предполагаем время или вид события)
Изменения в произношении:
I dunno = I don't know. "Don't know" в разговорном английском изменяется на "dunno".
I'm kinda tired = I am kind of tired, в разговорном английском последняя буква "kind of" зачастую изменяется на "kinda"
Изменения в грамматике:
You up for a movie tonight? В разговорном английском зачастую выпадает вспомогательный глагол. На «правильном английском» этот вопрос звучал бы так: "Are you up for a movie tonight? Say 6 o'clock?"
И снова в разговорном английском «выпадают» слова. Полная версия этого вопроса звучала бы так: "Let's say 6 o'clock" or "Shall we say 6 o'clock?" (Shall делает этот вопрос более вежливым и формальным).

UNIT 12
Part 1. Text 12:   MODEL-BUILDING IN SCIENCE
The scientific method is a **procedure** for the **construction and verification of models**. After a problem is formulated, the process consists of four stages.

1. Simplification/Idealization.
As mentioned previously, a model contains the essential structure of objects or events. The first stage identifies the relevant features of the real world.

2. Representation/Measurement.
The symbols in a formal language are given meaning as objects, events, or relationships in the real world. This is the process used in translating "word problems" to algebraic expressions in high school algebra. This process is called representation of the world. In statistics, the symbols of algebra (numbers) are given meaning in a process called *measurement.*

3. Manipulation/Transformation.
Sentences in the language are transformed into other statements in the language. In this manner **implications** of the model are derived.

4. Verification.
Selected implications derived in the previous stage are **compared with** experiments or observations in the real world. Because of the idealization and simplification of the model-building process, no model can ever be in perfect agreement with the real world. In all cases, the important question is not whether the model is true, but whether the model was adequate for the purpose at hand. Model-building in science is a continuing process. New and more powerful models replace less powerful models, with "truth" being a **closer approximation** to the real world.

These four stages and their relationship to one another are illustrated below.
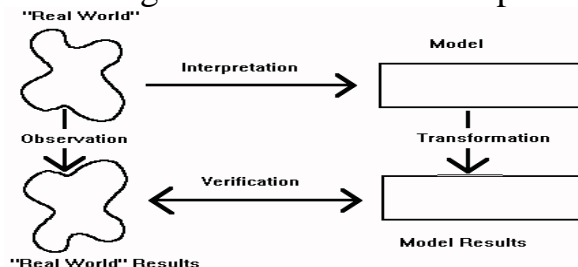
ADEQUACY AND GOODNESS OF MODELS
In general, the greater the number of simplifying assumptions made about the essential structure of the real world, the simpler the model. The goal of the scientist is to create simple models that have a great deal of **explanatory power**. Such models are called **parsimonious models**. In most cases, however, simple yet powerful models are not available to the social scientist. A **trade-off** occurs between the power of the model and the number of simplifying assumptions made about the world. A social or behavioral scientist must decide at what point the **gain** in the explanatory power of the model no longer **warrants** the **additional complexity** of the model.

MATHEMATICAL MODELS
The power of the mathematical model is **derived from** a number of sources. First, the language has been **used extensively** in the past and many models exist as examples. Some very general models exist which may describe a large number of real world

situations. In statistics, for example, the **normal curve** and the **general linear model** often serve the social scientist in many different situations. Second, many transformations are available in the language of mathematics.

Third, mathematics permit thoughts which are not easily expressed in other languages. For example, "What if I could travel approaching the speed of light?" or "What if I could flip this coin an infinite number of times?" In statistics these "what if" questions often take the form of questions like "What would happen if I took an infinite number of infinitely precise measurements?" or "What would happen if I repeated this experiment an infinite number of times?"

Finally, it is often possible to maximize or minimize the form of the model. Given that the **essence** of the real world has been **captured** by the model, what values of the **parameters** optimize (minimize or maximize) the model. For example, if the design of a race car can be accurately modeled using mathematics, what changes in design will result in the least possible wind resistance? Mathematical procedures are available which make these kinds of transformations possible.

Vocabulary:

Procedure – 1. а) образ действия; порядок осуществления действия; процедура
　　　to establish a procedure — определить/установить порядок проведения чего-л.
　　　to follow a procedure — придерживаться определенной процедуры
　　　б) методика, метод (проведения опыта, анализа)
　　　testing procedure — метод испытаний
　　　2. процесс, операция; технологический процесс
　　　normal, proper, regular, standard procedure — обычная/стандартная процедура

construction and verification of model – построение и проверка модели

simplification and idealization – упрощение и идеализация

representation and measurement - представление и измерение

manipulation and transformation – манипуляция и преобразование

implication - следствие, вывод; последствия, результаты

verification - удостоверение, подтверждение (предсказания, сомнения)

compare with - сопоставляться с (чем-л., кем-л.)

approximation аппроксимация, приближение

to a first approximation — в первом приближении

model-building – построение модели

explanatory power – объяснительная возможность

parsimonious model – экономная (консервативная) модель

trade-off - компромисс, уступка; to make a trade-off — пойти на компромисс

additional complexity – дополнительная сложность

derive –получать, извлекать

derive from - выводить (путем умозаключений и т. п.)

extensively – в значительной степени, сильно; экстенсионально

normal curve - нормальная кривая

infinite number of times – бесконечное количество

general linear model – обычная линейная модель

essence - существо, сущность

parameter - параметр, коэффициент, характеристика; **parameters -** границы, пределы

Part 2. Grammar.　　　Prepositional verb:　TO DO

to do away with – to get rid of, to abolish; to commit suicide:
We did away with illiteracy many years ago.
to do by — to treat: *The firm that does badly by its workers will not succeed.*
to do down – to try to make smb./ smth. appear small, unimportant:
They are all so incredibly catty and so dishonest, all trying to impress each other or do each other down the whole time.
to do for – to look after; to injure, to kill:
Although he is unwell he manages to do for himself. Don't say that we are done for.
to do in - to murder, kill: *The criminals have done in the old man.*
to do to - to cause, to happen :   *What harm have I ever done to you?*
to do out – to clean, to put in order: *I can never find anything when they've done my study out.*
to do out of – to cheat smb. of smth.: *He has done us out of 5 $ by his dishonesty.*
to do over – to give smb. a severe and thorough beating
Poor old Mike, he got done over by a gang.
to do up - to repair or improve the appearance of; to make attractive; to fasten:
She's bought a load of posters to do her room up with. Do up your coat.
to do with — to be/have something to do with, to be carried with:
"Why did you want to talk to me?"
 "Well, it's to do with a complaint that's been made about your work"
to do without — to live or continue in spite of lacking something, someone, or doing something: *I can't afford a car, so I guess I'll just have to do without.*

Word Combinations and Idioms:
- **what do you do (for a living)?– ** used to ask someone what their job is
- **to do nothing for/do a lot for** – to have a particular effect on something or someone.   *That colour does nothing for her.*
- **to do a lot for** – have a good effect on.
Getting the job has done a lot for her self-esteem.
- **to do wonders for**- have a very good effect on.
Moving to the city has done wonders for my social life.
- **to do sb. good** – to make someone feel better, more cheerful etc.
A break will do you good.
- **that will do!** – used to tell children that you want them to stop behaving in the way they are behaving
- **do as you're told** – used to tell children to behave in the way you tell them to...
- **would do well to do sth.** – used to advise someone that they should do something.
You'd do well to avoid that restaurant.
- **to do sth. to death** – to talk about or do something so often that it becomes boring.   *That joke has been done to death.*
- **to do well by sb.** – to treat someone well.
He's left home, but he still does well by his kids.

Part 3. Practical work.

Exercise 1. Fill in the correct particle or preposition in the following sentences.
1. If you do well or badly __ someone, you treat them well or badly.
2. I'd like to buy a run-down cottage that I can do____.
3. What have you done __ the poor boy?
4. They did her __ with an axe.
5. It is unhealthy and dangerous to do __ sleep.
6. "What's your book about?" "Well, it's to do __ human behaviour."

Exercise 2. Choose the correct answer.
They say Bates ____ his wife .
a) did with   b) did up   c) did without   d) did in
Look, what the thieves _____ the furniture.
a) did in   b) did to   c) did by   d) did with
3. The director cannot _____ a secretary.
a) do to   b) do without   c) do by   d) do in
4. How long did it take you to _____ your bike?
a) do up   b) do by   c) do with   d) do without
5. He ____ well ____ his family.
a) does ... with   b) does ... to   c) does ... by   d) does ... without
6. She's refused to have anything to _____ him since he was arrested for drinks and driving.
a) do to   b) do by   c) do without   d) do with

Exercise 3. Match the two parts of the sentences.

1. My neighbour tried ...	a. ... we're not going anywhere particularly smart.
2. Look ...	
3. "Mind your own business, would you? It has nothing ...	b. ... to do with you what my son does!"
	c. ... to do herself in by taking poison.
4. He is always complaining that ...	d. ... he's so hard done by, but he seems pretty fortunate to me.
5. Don't bother doing yourself up ...	
6. Mr. Sharp is not here, ...	e. ... you will have to do without speaking to him.
	f. ... what the rain has done to the flowers.

Exercise 4. Match each phrasal verb in column A with a word in column B to give a common phrase. Then find a verb in column C which defines each phrasal verb.

Column A	Column B	Column C
1 do sth out	a) a house	to tolerate
2 do away with	b) a cigarette	to clean
3 do without	c) sb's impudence	to manage without
4 do for	d) a wardrobe	to clean sb's. place
5 do with	e) the death penalty	to cause sth. to end
6 do sb down	f) an animal	to criticize
7 do sb over	g) a person	to injure
8 do sth in	h) a neck	to beat sb. severely

Exercise 5. Replace each of the italicised words in the sentences below with a phrasal verb, making sure that it fits grammatically into the sentence.

1. In nursery schools children are taught *to take care* of themselves. 2. Please break the news carefully to him or he'll *never recover*. 3. Whenever she tried *to clean out* his study he asked her not to touch his papers. 4. I can *fasten* my shoe-laces, they are too short. 5. During the war our people had *to dispense with* a lot of things of first necessity. 6. He told the guide that he wouldn't allow anybody *to cheat* him *of* the seat he had duly paid for. 7. I don't like the way she wears he jacket. It always looks like it needs *buttoning* up. 8. You'll have to pay if you want *to get* your flat *painted* and *decorated*.

Exercise 6. Supply the appropriate particle.
He's been with us so long I don't think we can't do … him now. What are we going to do ... the food left over from the party? She asked me to do ... her dress for her at the back. She can't do ... a secretary. They say they will do ... the hostage if the ransom isn't paid by tomorrow. She could do ... with herself during a fit of depression. It's time the children's toy cupboard was done ... . I feel quite done … but I think I can do … an hours sleep till the party. I'll tip you off and I am sure you can do … anybody's help. We've failed to do … … the old regulations for reasons that are completely outside our control.

Exercise 7. Answer the following questions.
1. How long can a man do without food? Are you aware of the latest medical experiments?
2. Would you try to do without luxuries if your monthly housekeeping came to a sum you hadn't foreseen?
3. Why don't children like doing up their coats?
4. Would you be able to do with the Hornby dictionary when translating an article on medicine?
5. What might make you feel done up?
6. Have you ever been done out of some money? How did it come about? Who was to blame for that?
7. Would you like to have the walls of your rooms painted or papered when you do the rooms up next spring?
8. Can you say that we have done away with prejudices?

Exercise 8. Translate the following sentence.
1. Пора, наконец, покончить с нарушением дисциплины. 2. Старой бабушке было трудно убирать свою большую квартиру. 3. Они должны помочь ему, иначе он умрет. 4. Если бы меня не обсчитали на 14 гривен, я думаю, я бы обошелся той суммой, которая у меня была. 5. Я думаю, что на этой работе они могут обойтись без меня, так как я еще новичок в этом деле. 6. Сегодня холодно, застегни пальто, а то ты простудишься. 7. Вы говорите, что ваши ежемесячные налоги составляют 300 фунтов? Боюсь, что вас обманули на 20 фунтов. 8. Ремонт квартиры в современном стиле будет стоить достаточно дорого.

UNIT 13

Part 1. Text 13: POLYNOMIAL FUNCTION. TRICKS OF THE TRADE.

Polynomials Jargon. The term "*polynomial*" has multiple uses: (1) it is used to describe polynomial expressions, (2) it is used to describe polynomial functions, and, (3) despite the Greek prefix "poly" that means "many," it is also used to refer to solitary power functions like $y=-3x^7$. This condensation of terminology is not unusual in mathematics: recall, for example, the various uses of "−": (1) to signify a negative number, (2) to represent subtraction between two numbers, and (3) to signify multiplication by −1, as in $-x = (-1)x$.

Select a "Convenient" *Test Value*. For various purposes, when analyzing a function, it is necessary to select "test values" in certain intervals. You are permitted to select a value in each such interval that makes your calculations as easy as possible. Typically, 0 or an integer close to 0, if there is one in the given interval, is the most convenient.

Continuity and "Smoothness". Polynomial functions are continuous everywhere, and very smooth—no corners, breaks, or holes.

Maximum Number of x-Intercepts. The maximum number of x-intercepts equals the degree of the polynomial. This follows from the Fundamental Theorem of Algebra, which states that a polynomial of degree n can be expressed as a product of n linear factors of the form $(ax+b)$, where a and b need not be real-valued. Such a linear factor gives rise to a zero, $-b/a$, which is also an x-intercept if it is real-valued.

Minimum Number of x-Intercepts. The minimum number of x-intercepts depends on whether the degree, $n > 0$, is odd or even. If n is odd, there is at least one x-intercept but if n is even, there may not be any.

Maximum Number of Turning Points. The maximum number of turning points is one less than the degree of the polynomial. So, if the degree is n, the maximum number of turning points is $n-1$.

Minimum Number of Turning Points. The minimum number of turning points depends on whether the degree, $n > 0$, is odd or even. If n is even, there is at least one turning point but if n is odd, there may not be any.

**End Behaviors**. For polynomials of degree greater than 0, there are only 4 possible end behaviors. These behaviors are shown in the following table and illustrated below with the graphs of x^2, $-x^2$, x^3, and $-x^3$

Leading Coefficient	Degree	
	Even	**Odd**
+	↑↑(Up left; Up right)	↓↑(Down left; Up right)
−	↓↓(Down left; Down right)	↑↓(Up left; Down right)
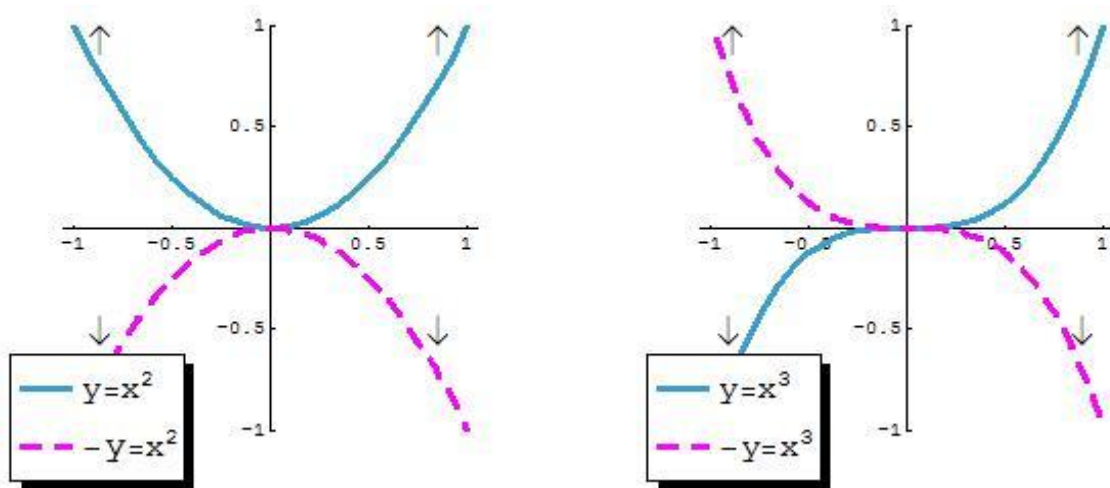
Graphing an Elementary Polynomial in Factored Form:
Example of a Cubic: $y=(x-1)(x+2)^2$

First Approach. Plot the *y*-intercept (set *x*=0 and solve for *y*) and plot the *x*-intercept (set *y*=0 and solve for *x*). Here, the *y*-intercept is $y=(0-1)(0+2)^2 = -4$ and the *x*-intercepts are determined by solving for *x*: $0=(x-1)(x+2)^2$. Setting each factor to 0, *x*–1=0 and $(x+2)^2=0$, we get *x*=1 and *x*=–2. You can now plot the intercepts together with the end behaviors of a cubic with positive leading coefficient (down on the left,
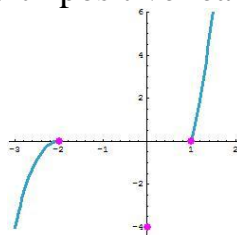
up on the right):
You may see how to complete the curve at this point, by smoothly connecting the curves and points.

Second Approach. As above, find the *x*- and *y*-intercepts. The *x*-intercepts are the only places where the *y*-value may, but need not, change sign. So, with two *x*-intercepts, –2 and 1, the *x*-axis is split into three intervals: $(-\infty,-2)$, $(-2,1)$, and $(1,\infty)$ where the function is either always positive (the graph is in the upper half-plane) or always negative (the graph is in the lower half-plane). Selecting convenient "test values" on each interval, say *x*=–3, *x*=0, and *x*=2, and substituting into the formula for *y*, we get

Test value	$y=(x-1)(x+2)^2$	Sign of *y*
–3	–4	–
0	–4	–
2	16	+

Using the signs in this table, we can plot the intercepts and then sketch the graph near the *x*-intercepts in the correct half-plane on each side (a sign of "+" is sketched in the top half-plane, a sign of "–" is sketched in the bottom half-plane):
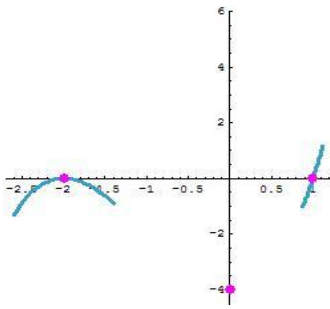
The final step is to smoothly connect the points and extend the graph at the ends. As a check, note that because the multiplicity of the zero $x= -2$ is even (the factor $(x+2)$ appears two times in the factored form) , the graph touches but does not cross the x-axis and because the multiplicity of the zero $x=1$ is odd (the factor $(x-1)$ appears one time in the factored form), the graph crosses the x-axis.
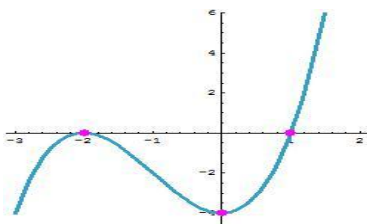
Intervals of Increase and Decrease. Should the endpoints of an interval of increase or decrease be included in the interval? Here, we are referring to an interval property and not a point property, so the endpoints are not essential to reflect the underlying geometry. In fact, the property could easily be restricted to open intervals to avoid this issue. Textbook authors vary in their usage and you will want to follow your textbook author and your teacher's usage on a test. However, working within the standard definitions (f is *increasing* means: $a < b$ implies $f(a) < f(b)$; f is *decreasing* means: $a < b$ implies $f(a) > f(b)$), the endpoints could be included if the function is defined at the endpoints. For polynomials, this is always the case.

Intervals of Concavity. Should the endpoints of an interval where a function is concave up or concave down be included in the interval? In general, concavity is an interval property and not a point property, so the endpoints are not essential to reflect the underlying geometry. In fact, the property could easily be restricted to open intervals to avoid this issue. Textbook authors vary in their usage and you will want to follow your textbook author and your teacher's usage on a test. However, working within standard definitions (f is *concave up* on the interval I means: f' is increasing on I; f is *concave down* on the interval I means: f' is decreasing on I), the endpoints could be included if the derivative, f', is defined at the endpoints. For polynomials, this is always the case. For nonpolynomials, it needs to be checked.

Part 2.   Common "MAKE" and "DO" phrases

MAKE…   DO…

an appointment – назначить встречу   **one's best (to/on)** – сделать все возможное
arrangements – сделать приготовления   **business (with)** – иметь дело (с); торговать

the bed – стлать постель
coffee – приготовить кофе
a call – сделать телефонный звонок
a complaint (about) – жаловаться (на)
a decision (about) – принять решение (о)
dinner – приготовить обед (ужин)
an effort – сделать усилие, попытаться
an excuse (for) – извиниться (за)
friends (with) – подружиться (с)
a fuss (about) – поднять суматоху (из-за)
a good/bad impression (on) –произвести хорошее/ плохое впечатление (на)
a list (of) – составить список
a mistake (in) – допустить ошибку (в)
a noise – поднять шум
plans (for) – строить планы (на)
a profit (on) – получить выгоду (прибыль)
progress (in) – прогрессировать (в)
a promise – дать обещание
a reservation (for) – зарезервировать (для)
a resolution – вынести резолюцию
a scene – устроить сцену
a speech – выступить с речью
a suggestion (about/to) - предложить
trouble (for) – создать проблему (для)

the cleaning – сделать уборку
a crossword puzzle –разгадывать кроссворд
damage (to) – нанести ущерб
the dishes – мыть посуду
one's duty – выполнять долг
errands – выполнять поручения
an exercise – делать упражнение
an experiment (with) – делать эксперимент
a favour (for) – делать одолжение
a good job (on) – хорошо выполнить работу
one's hair – сделать прическу
harm (to) – вредить
the ironing – погладить, поутюжить
one's homework – сделать дом. задание
the housework – сделать работу по дому
a job – выполнить работу
the laundry – постирать
an operation (on) – провести операцию (на)
a problem – создать проблему
research (on) – провести исследование (о)
the shopping – сделать покупки
something interesting (for) – сделать что-то интересное (для)
well/badly (in) – успевать/не успевать (в)
work – делать работу

Task 1. Translate the sentences from Russian into English using *to do* or *to make* phrases.

1. Майк только что разгадал кроссворд. 2. Мой друг пообещал учиться усерднее. 3. Анна начала приготовления к предстоящей вечеринке. 4. Роджер сделал все возможное, чтобы сделать ее счастливее. 5. Он проделал хорошую работу и отремонтировал мою машину. 6. Сделайте мне одолжение, и извинитесь перед ним за ваше опоздание. 7. Завтра я собираюсь сделать себе новою прическу. 8. Мы еще не составили список студентов, отсутствующих на занятиях. 9. Сильный ветер нанес ущерб урожаю этого года. 10. Не устраивай суеты из-за еды, мы не голодны. 11. Секретарь приготовит кофе для представителей английской компании. 12. На следующей неделе мы собираемся сделать предложение нашим клиентам. 13. Она произвела на нас хорошее впечатление. 14. Мы собираемся пожаловаться на наших новых соседей. 15. Студенты нашей группы провели исследование возрастающей функции и сделали заключение.

Proverbs with the verb *to do*:

Do as you would be done by.
Easy done it.
Never do things by halves.
So said, so done.
No sooner said than done.
Well begun is half done.
What's done can't be undone.
What we do willingly is easy.
Might goes before right.
Promise little but do much.

What is done can't be undone.
Do as you would be done by.
By doing nothing we learn to do ill.
Good counsel does no harm.
Man can do no more than he can.
What is worth doing at all is worth doing well.
When in Rome, do as the Romans do.
If we can't as we would, we must do as we can.
It is better to do well than to say well.
Handsome is that handsome does.
Better to do well than to say well.

Proverbs with the verb *to make*:

One swallow does not make summer.
Fine feathers make fine birds.
Haste makes waste.
To make a mountain out of mole hill.
The last drop makes the cup run over.
One lie makes many.
A heavy purse make a light heart.
Practice makes perfect.
Many hands make work light.
Necessity makes the old wife trot.
To make both ends meet.
Opportunity makes the thief.
Short debts make long friends.

Early to bed early to rise makes a man healthy wealthy and wise.
If you can't make best of what you have.
Company in distress makes trouble less.
As you make your bed, so you must lie on it.
One step above the sublime makes the ridiculous.
All work and no play makes Jack a dull boy.
He's not the best carpenter that makes the most chips.
Prosperity makes friends and adversity tries then.
To make or mar (neck or nothing; sink or swim).
Make hay while the sun shines (strike while iron is hot).
Too much knowledge makes the head bald.
Even reckoning makes long friends.

Part 3. Speaking activities. Computer technologies and spending on them.

Some people think that governments should spend as much money as possible on developing or buying computer technology. Other people disagree and think that this money should be spent on more basic needs. Which one of these opinions do you agree with? Use specific reasons and details to support your answer.

Man, through the ages has undergone many changes from the time when he depicted a herd of mammoths on the walls of a cave to nowadays when he can chart with anyone across the sea by use of modern means of communication. Some people think that in today's world government should spend more money on computers. However, others think that it is inappropriate and government should spend more money on food and shelters for poor people, medicine, education, etc. These two options are very different and controversial. But I think that developing computer technology brings people more advantages then they think it does.

First of all, humankind nowadays more and more depends on computers. We often do not suspect the presence of computers around us. For example, when we withdraw money from cash machines, get some gasoline on the gas station and pay with our credit cards in the stores. So, nowadays computer technology plays an essential role in our everyday life. Second of all, computer technology brings more job opportunities. For a country computer technology means power, knowledge and constant development. In addition to those practical benefits, the development of computer technology brings a lot of money to the country.

From the other side, government should not forget about poor people, who can not afford computers but need food and shelters. However, I think that computers help people gain more knowledge and experience and find a job to provide food and home for his family. So, basically, computers give people the opportunity to reach their goals and be innovative. To sum up, I think that computer technology gives people many benefits including the opportunity to improve one's knowledge and be more self-confident, persistent and experienced in this world.

UNIT 14

Part 1. Text 14:   TYPES OF ANGLES. DEFINITION.

When two straight lines meet at a point they form an angle.
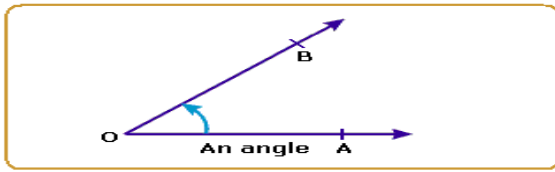
They are represented as ∠AOB or A ÔB.● $\overline{OA}$ and $\overline{OB}$ are called the arms of ∠AOB.

The point at which the arms meet (O) is known as the vertex of the angle.

The amount of turning from one arm (OA) to other (OB) is called the measure of the angle (AOB) and written as AOB.

An angle is measured in degrees, minutes and seconds.

If a ray rotates about the starting initial position, in anticlockwise direction, comes back to its original position after 1 complete revolution then it has rotated through 360°.

O is the initial position
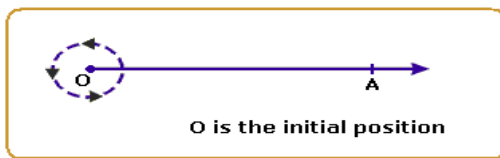
$\Rightarrow$ 1 complete rotation is divided into 360 equal parts. Each part is 1°.

Each part (1°) is divided into 60 equal parts, each part measures one minute, written as 1'.

1' is divided into 60 equal parts, each part measures 1 second, written as 1".

Degrees -----> minutes --------> seconds: $1^{o} = 60'$; $1' = 60''$

Recall that the union of two rays forms an angle.

In the figure, observe the different types of angles:
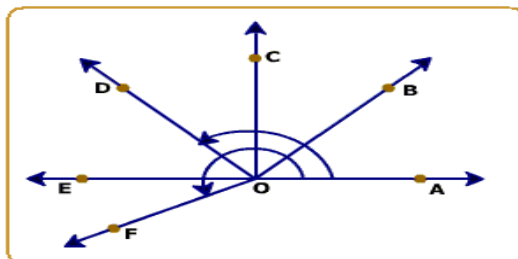
● A ÔB is an acute angle (0° < A ÔB < 90°)

● A ÔC is a right angle (an angle equal to 90°)

● A ÔD is an obtuse angle (90° < A ÔD < 180°)

● A ÔE is a straight angle (an angle equal to 180°)

● A ÔF (measured in anticlock wise direction) is a reflex angle

(180° < A ÔF < 360°)

Right angle

An angle whose measure is 90° is called a right angle.
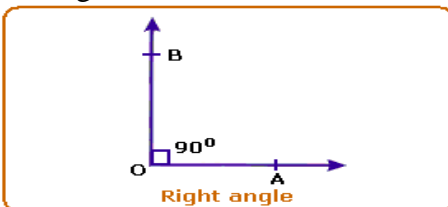
Acute angle

An angle whose measure is less then one right angle (i.e., less than 90°), is called an acute angle.
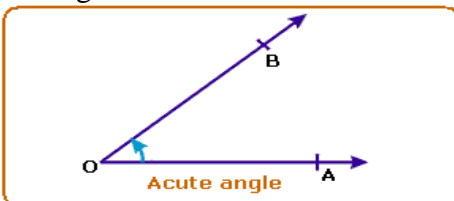
Obtuse angle

An angle whose measure is more than one right angle and less than two right angles (i.e., less than 180° and more than 90°) is called an obtuse angle.

Obtuse angle
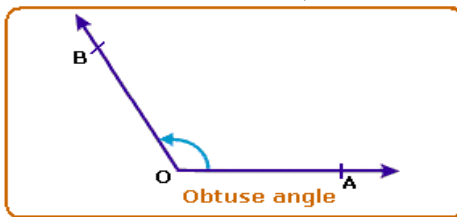
Straight angle

An angle whose measure is 180° is called a straight angle.

Straight angle
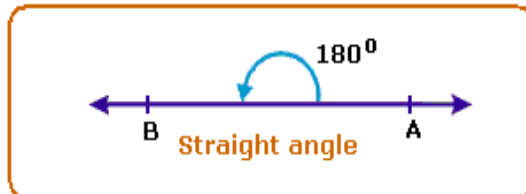
Reflex angle

An angle whose measure is more than 180° and less than 360° is called a reflex angle.
It is written as ref. $\angle AOB$.

Reflex angle
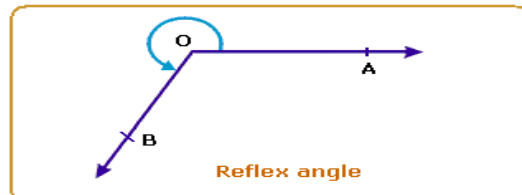
Complete angle

An angle whose measure is 360° is called a complete angle.

Complete angle
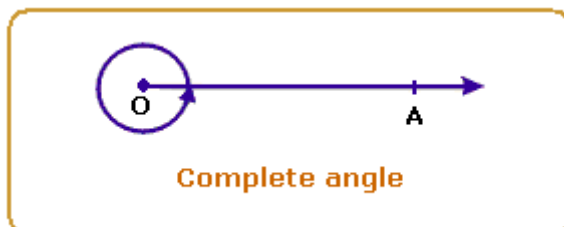
Equal angles: Two angles are said to be equal, if they have the same measure.

Adjacent angles

Two angles having a common vertex and a common arm, such that the other arms of these angles are on opposite sides of the common arm, are called adjacent angles.
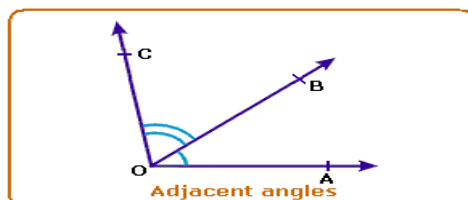
Adjacent angles

● O is the common vertex.

● $A\hat{O}B$ and $B\hat{O}C$ are adjacent angles.

● Arm BO separates the two angles.

Complementary angles

If the sum of the two angles is one right angle (i.e., 90°), they are called complementary angles.
If the measure of $A\hat{O}C = a^o$, $C\hat{O}B = b^o$, then $a^o + b^o = 90^o$.

Therefore $A\hat{O}C$ and $C\hat{O}B$ are complementary angles.

$\widehat{AOC}$ is complement of $\widehat{COB}$.

Complementary angles
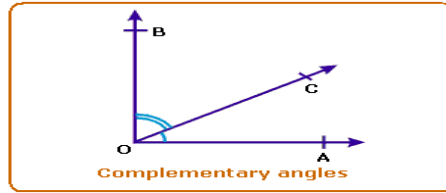
Supplementary angles.
Two angles are said to be supplementary, if the sum of their measures is 180°.
Example: Angles measuring 130° and 50° are supplementary angles.
                Two supplementary angles are the supplement of each other.

Supplementary angles
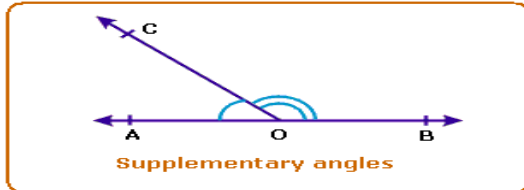
Vertically opposite angles
When two straight lines intersect each other at a point, the pairs of opposite angles so formed are called vertically opposite angles.
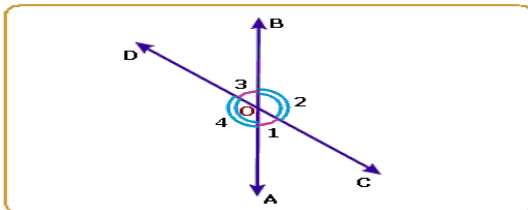
Angles 1 and 3 and angles 2 and 4 are vertically opposite angles.
Note: Vertically opposite angles are always equal.

Bisector of an angle
If a ray or a straight line passing through the vertex of that angle, divides the angle into two angles of equal measurement, then that line is known as the Bisector of that angle.

$\overrightarrow{OC}$ is the bisector of $\widehat{AOB}$
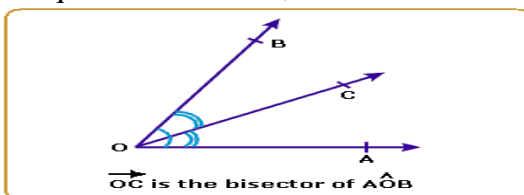
$\widehat{BOC} = \widehat{COA}$

and $\widehat{BOC} + \widehat{COA} = \widehat{AOB}$

and $\widehat{AOB} = 2\widehat{BOC} = 2\widehat{COA}$

Linear pair of angles
Two adjacent angles are said to form a linear pair of angles, if their non-common arms are two opposite rays. Recall adjacent angles. Now observe the pairs of angles in the figure.
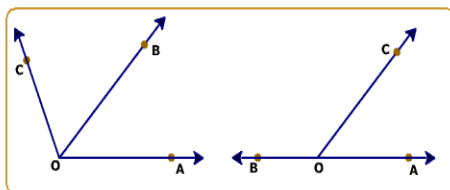
In fig, $\widehat{AOB}$ and $\widehat{BOC}$ are adjacent angles. $\overrightarrow{OB}$ is the common arm.

$\overrightarrow{OA}$ and $\overrightarrow{OC}$ are two non-common (or distinct) arms. Observe that the angles have the same vertex O.

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Part 3. Practical work: **TO MAKE**

to make for - to move especially quickly in the direction of something :
*We **made for** St Louis as fast as possible.*

to make from — to produce; to shape; to form:
*The children's playhouse has been **made from** a pile of cardboard boxes*

to make into - to change something or someone into something else or a kind of person:

*Can you **make** this dress **into** a skirt?*

to make out — to see clearly, to manage to read, to see, to hear; to understand:
*You can just **make out** the farm in the distance.*

to make of - to understand something in a particular way:
*I could **make** nothing **of** the chairman's remark.*

to make off – to leave hurriedly: *He **made off** as soon as he heard their car turn into the drive.*

to make over — to change: *The garage **has been made over** into a playroom.*

to make up - to be part of, to complete: *These three articles **make up** the whole book.*

to make up to – to seek favour with somebody:
*No one respects a man who always **makes up to** influential people.*

to make up to sb. for sth. – to compensate for something: *You're late but I'll **make** it **up to you.***

Word Combinations and Idioms:

* **to make a living (doing sth)** – to earn the money that you need.
  *He **makes a living** repairing second hand cars.*
* **to make a profit/loss** – to get or lose money in a trade or business.
  *The company has **made a big loss** this year.*
* **to make believe** – to pretend that something is true, especially as a game.
  *We **made believe** we were on a secret island.*
* **to make like** – to behave in a way that you hope will give people a particular opinion of you.
  *He **makes like** he's got it all figured out.*
* **to make as if** – to do sth to move in a way that makes it seem that you are going to do something.
  *Fred, still grinning, **made as if** to hit me.*
* **to make it up** – to become friendly with someone again after you have had an argument.
  *Have you **made it up** with your sister yet?*
* **to make it up** – to do something good for someone because you feel responsible for something bad that happened to them. *I'll **make it up** to you one day, I promise.*
* **to make it quick/snappy** – used to tell someone to do something as quickly as possible.
  *Two coffees please, and **make it snappy**.*
* **to make a deadline/target/rate** – to succeed in doing something by a particular time, producing a particular amount etc
* **to make the papers/headlines/front page etc** – to be interesting or important enough to be printed in the papers. *News of their divorce **made the headlines**.*
* **to make the team/squad** – to be good enough to be chosen to play in a sports team.
   *He'll never **make the football team**.*
* **to make or break** – to cause either great success or complete failure.
  *Critics can **make or break** a young performer.*
* **it makes a change** – used to say that something is pleasantly different from normal.
  *It **makes a change** to get something other than bills in the post!*
* **that makes two of us** – used to agree with someone's opinion or to say that something that happened to them has also happened to you.
  *"I think I've had enough of this party." "That **makes two of us**."*
* **to make sb's day** – to make someone very happy. *Hearing her voice on the phone **made my day**.*
* **to make sense** – a) to have a clear meaning that is easy to understand.
            *Read this and tell me if it **makes sense**.*

b) to have a good reason or explanation. *It doesn't **make sense** - why would she do such a thing?*
c) to be a sensible thing to do. *It **makes sense** to save money while you can.*

- **to be made for each other** – to be completely suitable for each other, especially as husband and wife. *Jacinta and Dermot were **made for each other**.*
- **to have (got) it made** – to have everything that you need for a happy life.
    *Nice house, good job, lovely family - **you've got it made**!*
- **to see what sb is (really) made of** – to find out how strong, brave someone is.
- **I'm not made of money** – used to say that you cannot afford something.
    *I can't buy you shoes as well - **I'm not made of money!***
- **to be made (for life)** – to be so rich that you will never have to work again.
    *If the deal is successful I'll **be made for life**.*
- **I wasn't made for** – used to say that you are not enjoying a job or activity.
    *I **wasn't made for** housework.*
- **to make the most of** – to use an opportunity as successfully or usefully as possible.
    *We only have one day in Paris, so we'd better **make the most of it**.*
  to make a go of sth – to make something as successful as possible by trying or working hard.
    *She's determined **to make a go of** the business this time.*
- **to make too much of** – to treat something as if it is more important than it really is.
    *The press **made too much of** what was only meant as a joke.*
- **to make a day/night/evening of it** – to decide to spend a whole day, night etc doing something.
    *Why don't we go for a meal after the movie and really **make an evening of it**.*
- **do you want to make sth (out) of it?** – used to say that you are willing to have a fight or argument with someone
- **to make out a case (for)** – to find good enough reasons to prove something or explain why you need something.   *I'm sure we can **make out a case for** hiring another assistant.*
- **to make out like a bandit** – to get a lot of money or gifts, win a lot etc.
    *Those kids **make out like bandits** every Christmas.*

Exercise 1. Fill in the correct particle or preposition in the following sentences.
1. Can you make __ the shape of the ship over the horizon?
2. Can you make me a suit __ the length of cloth?
3. Can you make anything __ this strange letter?
4. It'll cost a lot of money to make the room __.
5. After the concert, the crowd made __ the nearest door.
6. Will you come, to make __ the party.
7. School has made the boy __ a coward.

Exercise 2. Choose the correct answer.
1. It's a shame to see so many fine old houses being _____ flats.
a. made out   b. made up   c. made into
2. There's someone outside the window, but I can't _____ who it is.
a. make up   b. make out   c. make over
3. It started raining so we _____ shelter.
a. made into   b. made for   c. made over
4. Sue had to _____ her income as a pianist by teaching piano students.
a. make up   b. make over   c. make out
5. The natives _____ excellent boats ____ tree trunks.
a. make ... out   b. make ... from   c. make ... of
6. What do you _____ the latest idea?
a. make from   b. make into   c. make of
7. It's an old church that has been _____ into homes.
a made up   b made of   c made over

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Exercise 3. Match the two parts of the sentences.

1. Mother can make a wonderful meal from bits of food ...
2. Looking through the mist ...
3. The builders laid the wrong floor tiles, so ...
4. Most men are needed ...
5. I don't know ...
6. Though badly damages by fire ...
7. If we buy the disused church ...

a. ... to make up the police force to its full strength.
b. ... left over from the day before.
c. ... the ship tried to make for her home port.
d. ... I could make out the figure of a woman standing under the lamp.
e. ... we could make it into an attractive home.
f. ... what to make of the boy's behaviour.
g. ... they'll have make the floor over.

Exercise 4. Match each phrasal verb with an appropriate definition of this verb.

Column A	Column B
1. make both ends meet	a) put cosmetics on
2. make fun of	b) compose
3. make friends	c) read sth. which is not written crearly
4. make one's living	d) ridicule someone/ something
5. make oneself at home	e) search for someone/ something
6. make out	f) decide
7. make up (2)	g) become a friend of someone
8. make up one's mind	h) earn enough money to live on
	i) manage to live on a small amount of money
	j) make oneself comfortable

Exercise 5. Replace each of the italicised words in the sentences below with a phrasal verb, making sure that it fits grammatically into the sentence.

1. I can't *understand* what he is driving at. 2. You may think that I have *invented* this news.3. Chemical equipment will *compose* a great part of our imports from Great Britain next year. 4. "Why don't Peter and Poly *make friends* again?" 5. I *can't see* what is written there. 6. I would not advise young girls to *apply cosmetics*. 7. Can you *change this* coat *into* a jacket? 8. His hand writing isn't easy to read, I can't *understand* some of the words. 9. The manager instructed the clerk to *write a cheque* in the name of Mr. Brown. 10. We can't *change* this room in a week, if requires more time and money.

Exercise 6. Supply the appropriate particle.

1. This book of fairy tales has no pictures; but I've made …… the deficiency by using my imagination.
2. You've made ... a very nice song.
3. She made …… everybody trying to make …… what she had done.
4. Men say that women like them to make …… them and women claim the opposite.
5. I can't make him … the seemed to be friendly and then suddenly he turned a cold shoulder on me.
6. If you can get him to make … the document you may be sure he'll do it well.
7. "It takes six players to make … a team," said the coach.
8. You must brush up mathematics, if you want to do well at the examination. It makes … an important part of the examination.
9. He must have read the story he can't have made it … on the spot.
10. No sooner had the alarm signal sounded than the fire-men sprang up to their feet and made … the cars.
11. The more he read the more puzzled he felt. He could not make … what the telegram meant.
12. Before you go shopping make … a list of things you are going to buy.
13. The firm peaceful policy of the state make … peace in the world.

Exercise 7. Answer the questions.
1. Where would you go to have the prescription **made up**?
2. What would you do if you felt you were wrong in a quarrel? Would you try to make it **up**?
In what case wouldn't you?
3. Can you reduce your weight if you keep to a diet and **make up for** it afterwards? Why did Old Miss Crawley decide to **make out** another will after she learned about Rawdon's marriage?
4. Do women **make up** the majority of the population in the word?
5. What do people mean when they say: "A good wife can **make up** a clever dish out of bits and pieces?" Can you?
6. Do you believe that a poet can **make up** a poem impromptu?
7. Do you usually buy new clothes or you try to **make** old one **into** new.
8. How often do you **make up**? Can you do without it?
9. Have you ever **made out** any document?

Exercise 8.Translate the following sentences.
1. Я не могу понять, как вы можете обходиться без словаря. 2. Арабы составляют основную часть населения в этой стране. 3. Передайте мне очки, я не могу разобрать мелкий шрифт. 4. Вам придется выписать копию счета, он потерял оригинал. 5. Сойдя с поезда, он сразу же направился к почтовому отделению. 6. Что-то не так в наших отношениях последнее время, мы то ссоримся, то миримся. 7. Мы задерживаемся с составлением списков. 8. Он хорошо слагает стихи. 9. Казалось удивительным, что сильная и красивая женщина флиртует с глупым и самодовольным пожилым мужчиной.

3.1. Communicative skills. Colloquial speech.
Read the dialogue and draw your attention to the lexical and grammatical transformations in spoken language.

Jennifer: Can you **gimme** a hand?	– Ты можешь помочь мне?
Sally: Sure. **Whaddya** doing'?	– Конечно. Что ты делаешь?
Jennifer: I'm trying to put this together but I **goofed up**.	– Я пытаюсь это собрать, но я ошиблась.
Sally: Lemme see. You just **hafta** put these on the other way. **See?**	– Давай посмотрим. Ты должна это соединить другим образом. Видишь?
Jennifer: Oh.	

Новые выражения: *Give (someone) a hand* – помочь кому-либо
Goof up – ошибаться (обычно несерьезную)
See? – Вам понятно? (Do you understand?)

Изменения в произношении:
Can you gimme a hand? - "give me" в разговорном английском изменяется на "gimme".
Whaddya doing'? , в разговорном английском "what are you" может меняться на "whatddya".
Lemme, в разговорном английском "let me" изменяется на "lemme"
Глаголы, оканчивающиеся на "ing" теряют конечную букву "g"
You just hafta put these on the other way. В разговорном английском при быстрой речи "have to" изменяется на "hafta".
Изменения в грамматике: See?
В разговорном английском зачастую выпадают слова. На «правильном английском» этот вопрос звучал бы так: Do you see? Это часто происходит в вопросительных предложениях.

UNIT 15
Part 1. Text 15: TRIGONOMETRY

In Greek 'Trigonon' means a triangle. 'Metron' means a measure. The combination of these two words gives us the word 'Trigonometry'. Trigonometry is the branch of mathematics that deals with the relations between the sides and angles of triangles. In our study we will deal with the right angled triangles only.

Trigonometrical Identities.
The trigonometric ratio's are: Sine, Cosine, Tangent, Cotangent, Secant, and Cosecant.

Trigonometric Tables.
1) to find the value of a t-ratio when the angle is given;
2) to find the angle when the value of the t-ratio is given. As an angle increases, the sine ratio increases, the cosine ratio decreases and the tangent ratio increases.

Angles. An angle is an amount of rotation of a half-line (or ray) in a plane about its end point from an initial position to a terminal position. The important terms are: Measurement of angle, Positive and Negative angles, Lines at right angles, Quadrants, Angle in standard position.

Measurement of Angles. To measure an angle we shall use two kinds of units, the degree unit and the radian unit. A degree (sexagesimal system) is defined to be an angle formed by half-line (or a ray) rotated about its end point (1/360) of a complete revolution.

Types of Angles: Acute angle, Obtuse angle, Right angle, Reflex angle, Straight angle.

Radian measure [Circular system]. A radian is the measure of an angle at the centre of a circle subtended by an arc, whose arc length is equal to the radius of the circle.

Grade measure (Centesimal system or French system).
The principal unit of this system is grade(g) which is one hundreds part of right angle.
The attempt to introduce this grade system in France was not successful.

Trigonometric Functions.
The circle whose radius is 1 unit whose centre is the origin of a rectangular co-ordinate system is called the unit circle. The six functions of q defined by the above equation are called trigonometric functions of **q** or circular functions of **q**.

1. cos **q** = x.   3. tan **q** = y/x.   5. sec **q** = 1/x.
2. sin **q** = y.   4. cot **q** = x/y.   6. cosec **q** = 1/y.

Circular Functions
The circular functions are functions of an angle. They are important in the study of triangles and modeling periodic phenomena, among many other applications. Trigonometric functions are commonly defined as ratios of two sides of a right triangle containing the angle, and can equivalently be defined as the lengths of various line segments from a unit circle. More modern definitions express them as infinite series or as solutions of certain differential equations, allowing their extension to arbitrary positive and negative values and even to complex numbers.

Periodic Functions.
The trigonometric functions belong to a large class of functions called periodic functions in which there is a regular repetition of the values of the function over a certain interval.

The variation of the values.
As the Sine of an angle increases the Cosine of the angle decreases from the value 0 to 1 and v.v.

Even and Odd functions: i) A function f(x) is said to be even if f(-x) = f(x).
                                            ii) A function f(x) is said to be odd if f(-x) = -f(x).

Tangent Functions.
The tangent function is defined in the form as tan **q** = x/y, where y is not equal to zero.

Other Circular Functions: 1. The reciprocal of cos **q** = 1/cos q = sec **q**.
                                            2. The reciprocal of sin **q** = 1/sin q = cosec **q**.
                                            3. The reciprocal of tan **q** = 1/tan q = cot **q**.

Identical properties of circular functions and trigonometric functions.
The Circular function of a real number *q* and the trigonometric function for the angle *qc* are same.
The identities for circular functions of real numbers hold for trigonometric functions of angle *q.*

Values of Trigonometric Functions. The Values of Trigonometric Functions of 90⁰ and 0⁰ are:
$\cos 90^\circ = 0$, $\sin 90^\circ = 1$, $\tan 90^\circ$ = Not defined, $\sec 90^\circ$ = Not defined, $\cot 90^\circ = 0$, $\csc 90^\circ = 1$, $\cos 0^\circ = 1$, $\sin 0^\circ = 0$, here $\csc 0^\circ$ and $\cot 0^\circ$ are not defined, $\sec 0^\circ = 1$, $\tan 0^\circ = 0$.

Signs of Trigonometric Ratios
    i) The numerical values of sin **q** and cos **q** cannot be greater than 1.
    ii) The numerical values of sec **q** and cosec **q** can never be less than 1.
    iii) There is no restriction on the values of tan **q** and cot **q** since they can take any value.

Table. Trigonometric ratios of Allied Angles.

	- q	90°- q	90° + q	180°- q	180° + q	270°- q	270° + q	2nP - q	2nP + q
sin q	-sin q	cos q	cos q	sin q	-sin q	-cos q	-cos q	-sin q	sin q
cos q	cos q	sin q	-sin q	-cos q	-cos q	-sin q	sin q	cos q	cos q
tan q	-tan q	cot q	-cot q	-tan q	tan q	cot q	-cot q	-tan q	tan q

Formula   For any two angles A and B, we have:
  Sin(A+B) = SinA CosB + CosA SinB   Tan(A+B) = (TanA + TanB) / (1 - TanA TanB)
  Cos(A+B) = CosA CosB + SinA SinB   Cot(A+B) = (CotB CotA - 1) / (CotB + CotA)

Trigonometric Ratios of Multiple and Sub-multiple Angles
 1. Sin2A = 2SinACosA;   2. Cos2A = Cos2A-Sin2A.

Conditional Trigonometric Identities
In the above topics many identities have been discussed. They are true for all values of the angles for which trigonometric functions are defined. In this section we prove identities, where a certain relationship exists among the angles considered.
Many interesting and important identities are established using the relation A+B+C=180⁰.

Graphs: In plotting the graph of any trigonometric function the angle may be regarded as measured either in radians or in degrees. If a trigonometric function is combined with an algebraic function it is customary to assume that the angle is measure in radians. **Graph of y = sin x.** As x increases from 180⁰ to 270⁰, sin **x** decreases from 0 to -1 and as x increases from 270⁰ to 360⁰, sin **x** increases from -1 to 0. The maximum absolute value of sin **x** = 1.

Graph of y = cos x. As x increases from 0 to 90⁰, cos **x** decreases from 1 to 0, as **x** increases from 90⁰ to 180⁰, cos **x** decreases from 0 to -1, as **x** increases from 180⁰ to 270⁰, cos **x** increases from -1 to 0, as **x** increases from 270⁰ to 360⁰, cos **x** increases from 0 to 1. Cos **x** is period and has a period **2p**.

Graph of y = tan x, the part of the curve from **p** to **2p** has the same form on the part from 1 to **p**. This implies that the fact tan **x** = tan **(p + x).** The whole curve consists of an endless number of branches having the same form as the branch corresponding to the values of **x** from.

Points observed from the graph:
1) The graph of sin **x** and cos **x** have no breaks and they lie between y=1 and y = -1. So sin **x** and cos**x** are continuous for all values of x and the values of sin **x** and cos **x** always lie between 1 and +1. Hence sin **x** and cos **x** are bounded function.
2) There are breaks in the graph of tan **x.** At these points tan q is not defined and tan **x** is a discontinuous function. The graph of tan **x** is not bounded and can assume all real values.

Summary:
1. Trigonometry is that branch of mathematics which deals with the measurements of sides and angles of triangles.
2. The figure obtained by rotating a given ray about its end point is called an angle.
3. An angle is called negative if the direction of rotation of ray from initial side to terminal.

Part 2. Grammar   THE GERUND
1. Forms. Tense and voice distinctions.

	Active	Passive
1. Indefinite	**writing**	**being written**
2. Perfect	**having written**	**having been written**

1. The Indefinite Gerund donotes an irrelative, future or simultaneous action with that of the predicate: Swimming is a good exercise. (irrelative) I'm surprised at hearing this. (simultaneous)

2. The Perfect Gerund denotes an action prior to that of the predicate:

He admitted **having made** the mistake.

A gerund is a verbal that ends in -*ing* and functions as a noun. The term *verbal* indicates that a gerund, like the other two kinds of verbals, is based on a verb and therefore expresses action or a state of being. However, since a gerund functions as a noun, it occupies some positions in a sentence that a noun ordinarily would, for example: subject, direct object, subject complement, and object of preposition.

a) **as the subject of the sentence:**   *Reading is her favourite occupation. Flying makes me nervous.*

b) **as the complement of the verb** *'to be'*: *Her greatest pleasure is reading.*
   *One of his duties is **attending** meetings. One of life's pleasures is **having** breakfast in bed.*
   *The hardest thing about **learning** English is understanding the gerund.*
   as the complement of different verbs: *He finished reading the book.*

c) **as a direct object:** *I remember reading it.*

d) **as a indirect object:** *I am fond of reading.*

e) **as an attribute:** *I had pleasure of reading in the newspaper of your success.*

f) **as an adverbial modifier:** *After reading the letter I put it into the drawer.*

g) **after prepositions**: *Can you sneeze without **opening** your mouth?   She is good at **painting**.*
   *They're keen on **windsurfing**. We arrived in Madrid after **driving** all night.*
   *She avoided him by **walking** on the opposite side of the road.*
   *My father decided against **postponing** his trip to Hungary.*

This is also true of certain expressions ending in a preposition, e.g. *in spite of, there's no point in:*
   *There's no point in **waiting**.   In spite of **missing** the train, we arrived on time.*

h) **after a number of** *'phrasal verbs'* **which are composed of a verb + preposition/adverb**

Example: *to look forward to, to give up, to be for/against, to take to, to put off, to keep on:*
   *I look forward to **hearing** from you soon. (*at the end of a letter)
   *When are you going to give up **smoking**?*
   *She always puts off **going** to the dentist.*
   *He kept on **asking** for money.*

NOTE: There are some phrasal verbs and other expressions that include the word *'to'* as a preposition, ***not*** as part of a *to-infinitive*: - *to look forward to, to take to, to be accustomed to, to be used to.* It is important to recognise that *'to'* is a preposition in these cases, as it must be followed by a gerund: *We are looking forward **to seeing** you.   I am used **to waiting** for buses.*
                    *She didn't really take **to studying** English.*

It is possible to check whether "*to*" is a preposition or part of a *to-infinitive*: if you can put a noun or the pronoun *'it'* after it, then it is a preposition and must be followed by a gerund:
   *I am accustomed **to it** (the cold).   I am accustomed **to being** cold.*

e) **in compound nouns:** *a **driving** lesson, a **swimming** pool, bird-**watching**, train-**spotting***

It is clear that the meaning is that of a noun, not of a continuous verb.

Example: the pool is not swimming, it is a *pool for swimming in.*

f) **after the expressions:**   *can't help, can't stand, it's no use/good,* and the adjective *worth:*
   *She couldn't help **falling** in love with him.*
   *I can't stand **being** stuck in traffic jams.*
   *It's no use/good **trying** to escape.*
   *It might be worth **phoning** the station to check the time of the train.*

Part 3. Practical work.

Exercise 1. Translate the sentences from English into Russian.
He **was accused of** having broken the law. I **apologize for** being so awkward. I don't **approve of** his staying at their place. Who is to **blame for** starting the fire? Can you ever **forgive me for** forgetting your birthday? I'd like to **congratulate** you **on** concluding the contract with them. You can always **count on** Jim's sitting with a baby, he'll never fail you. It **depends on** raising a claim timely. I can't **hear of** helping her after her provoking behaviour. Why didn't you **inform** me **of** his leaving? He **insisted on** his coming with us. He **objected to** visiting my uncle. Why do you **persist in** interrupting me when I have repeatedly asked you to stop? Nothing shall **prevent** us **from** reaching our aim! Isn't it time that the talks **resulted in** signing the contract. Can you **stop** the child **from** getting into mischief? They **succeeded in** finding a good flat. The officer was **suspended from** tank battalion commanding. **Thank** you **for** coming with us. Are you **thinking of** buying a house? She **spends** her spare time **in** gardening. This plan **calls for** arranging the showroom at our premises.

We have some **difficulties in** drawing up a contract for these services. I see not **harm in** letting them enjoy themselves in vacation time. We have particular **interest in** extending our trade with you. There is no **chance of** winning. The **art of** living is the art of loving. I have not **experience in** building houses. This is a nasty **habit of** smoking in the room. The **idea of** taking her out came to his mind. We'll find the **means of** sending you this cargo immediately. Our **mistake of** doing business with them led us to bankruptcy. We had no **opportunity of** meeting interesting people there. I don't see any **point in** proposing him this post. At last he understood the **point of** buying control stock. Have you any **reason for** saying such a thing? The charterers have the **right of** loading the vessel at night time. Have you any **objection to** signing this document? He expressed his **surprise at** meeting her there. There is no **fear of** damaging the goods if they are packed. We have no **intention of** ordering such machines.

You can hardly **avoid** meeting her. She **stopped** smoking on her doctor's advice. She **kept on** interrupting me while I was speaking. They **postpone** sending an answer to the request. How long will you **continue** working? She **loathes** traveling by air. She **considered** resigning. He **denied** knowing anything about the plan. My work **involves** filing and typing the letters. **Would you mind** closing the door? **It would be hard** to justify his failing three exams. We have just **missed** having nasty accident. Can you **recollect** my calling you? On Sundays Jane always **practices** playing the piano.

She **resents** having to wait. I'll **risk** trying my hand at it. She **was afraid of** falling. He **was angry for** her ignoring him. He is **interested in** developing the project. She'll **be sorry for** being rude.I **am** simply **fond of** cooking. She **can't stand** being contradicted. He didn't **feel like** going out. Did you have any **difficulty in** getting a visa? It **is no use** crying over split milk. He **is slow at** doing sums. She'll **be sorry for** having said this. He **is proud of** having won the computer programming contest. He **was surprised at** having been asked about it. **It's no use worrying** about it. There is nothing you can do. He **couldn't help** laughing.

It's worth while studying Japanese. Did it take much time **to get used to** driving on the left? **I'm used to** hearing about the odd things he does. She **admitted** having done wrong. He **reported** having seen the escaped convict. She **acknowledged** having been frightened. We **didn't anticipate** being treated like that. She **didn't fancy** going out. I **can't imagine** marrying a girl of that sort. I **suggest** going home. He didn't **like** being read to. This **prevented** the letter **from** being sent off. She was quite **disappointed at** not seeing them there again. What **is worth** doing at all **is worth** doing well. **After** sleeping for about an hour he was awakened by a loud noise. Extensions are being made to the plant **with a view to** increasing the output.

Exercise 2. Open the brackets using the proper form of the gerund.
The matter is not worth (to speak of). On (to introduce) they easily fell to (to talk). Why do you avoid (to see) me? He tried to avoid (to see). We insist on (to send) him there at once. He insists on (to send) there instead of me. Do you mind (to examine) the first? He showed no sign of (to know) them. She showed no sign of (to impress). I was annoyed at (to interrupt) every other moment. In (to discuss) the problem they touched upon some very interesting items. The equipment must go through a number of tests before (to install). He hated (to remind) people of their duties or (to remind) of his. The operator can set the machine in motion by (to push) the button or (to press) the pedal. The water requires (to filter).
Excuse me for (to give) you so much trouble. You never mentioned (to speak) to them on this subject. He was proud of (to award) the prize. I don't remember ever (to see) you. I don't remember (to ask) this question. The boys were punished for (to break) the window. The boy was afraid of (to punish) and hid himself. He was quite serious in (to say) that he was leaving the place for good. She seemed sorry for (to be) rude to me. He confessed (to forget) that we were to come on Friday. After (to examine) thoroughly by the doctor, the young man was admitted to the sports club. They accused me of (to mislead) them. She was so eagerly looking forward to (to give) this post that she was greatly disappointed at not even (to offer) it.

Exercise 3. Translate the sentences from Russian into English.
Я возражаю против того, чтобы вы завершили это исследование. Вы не будете против, если я открою дверь? Недавно он бросил курить. Я хорошо помню, что встретил его пять лет назад в Берлине. Попробуйте бегать по утрам (jog). Вы почувствуете себя намного лучше. Я люблю читать. Чтение – мое самое любимое занятие. Перестаньте разговаривать. Я совершенно не слышу лектора. Мы остановились, чтобы рассмотреть витрину. Я предложил поехать туда на машине, но мои друзья не согласились. Как насчет того, чтобы пойти в кино? Избегайте читать при плохом освещении! Бессмысленно давать ему советы, он все равно не принимает их к сведению. Машина очень грязная; ее необходимо вымыть. Извините, что опоздал. Я вовсе не намеревался сегодня идти на дискотеку. Перед отъездом не забудьте мне позвонить. Он занят подготовкой к докладу, у него сейчас очень мало свободного времени.

Exercise 4. Translate the following into English using Gerunds after the verbs in brackets. Fill in prepositions where necessary.
Я не виню тебя за то, что тебе так хочется уехать из города. (to blame)
Тогда я заподозрил его в том, что он меня дразнит. (to suspect)
Нам было не трудно работать вместе. (to have no difficulty)
 Он настаивал на том, чтобы научить ее работать на PC. (to insist)
Не было ничего, что могло бы помешать ему вернуться в Лондон. (to prevent)
Он извинился, что не пришел вовремя. (to apologize)
Мне удалось заставить Энн говорить правду. (to succeed)
Отец часто обвинял меня в том, что я отношусь к дому как к отелю. (to accuse)
Она настояла на том, чтобы заплатить за такси. (to insist)
Дэн уговорил Беллу остаться на обед. (to talk into)
Доктор начал с того, что определил его пульс. (to begin)
Он настоял на том, чтобы главного менеджера немедленно пригласили на совет. (to insist)
Я спросил его, как ему нравится быть отцом. (to feel about)
Как она объяснила покупку этой дорогой и ненужной вещи? (to account)
Он упрекал себя за то, что не попытался поговорить с ней. (to reproach)

UNIT 16
Part 1. Text 16: SET THEORY

Set theory - Set theory is the branch of mathematics that studies sets, which are collections of objects. Although any type of object can be collected into a set, set theory is applied most often to objects that are relevant to mathematics. The modern study of set theory was initiated by Cantor and Dedekind.

Introduction

In Mathematics, a well-defined collection of definite objects is called a set. George Cantor is regarded as the "Father of Set theory". The concept of "Sets" is basic in all branches of mathematics.

Basic Definitions

Set: A well-defined collection of distinct objects is called a set.

Notation of Sets: Capital letters are usually used to denote or represent a set.

There are two methods of **representing a set**: i) Roster Method, ii) Set builder form.

Finite and Infinite Sets: A set is finite if it contains a specific number of elements. Otherwise, a set is an infinite set.

Null Set or Empty Set or Void Set: A set with no elements is an empty set.

Singleton Set or Singlets: A set consisting of a single element is called a singleton set or singlet. The cardinality of the singleton set is 1.

Equivalent Sets: Two finite sets A and B are said to be equivalent sets if cardinality of both sets are equal i.e. $n(A) = n(B)$.

Equal Sets: Two sets A and B are equal if and only if they contain the same elements i.e. if every element of A is in B and every element of B is in A. We denote the equality by $A = B$.

Cardinality of a Set A: The number of elements in a finite set A, is the cardinality of A and is denoted by $n(A)$.

Universal Set: In any application of the theory of sets, the members of all sets under consideration usually belong to some fixed large set called the universal set.

Subsets: If A and B are sets such that each element of A is an element of B, then we say that A is a subset of B and write $A \subseteq B$.

Power Set: The family of all subsets of any set S is called the power set of S. We denote the power set of S by $P(S)$.

Some Results of Subsets. Prove that Null Set is the subset of every set.

Every set A is a subset of universal set U since, by definition all elements of A belong to U. Also the null set $f \subseteq A$. The null set f is a subset of every set, in particular $f \subseteq A$. By hypothesis, $A \subseteq f$. The two conditions imply $A = f$.

The total number of all possible subsets of a given set containing n elements is 2n.

Operations on Sets

The Operations on Sets are: Union of sets, Intersection of sets, Disjoint sets, Difference of two sets (Relative complement), Symmetric Difference of two sets, Complement of a set.

Venn Diagrams [Euler-Venn Diagrams]

A Venn diagram is a pictorial representation of sets by set of points in the plane.
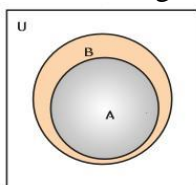
The universal set U is represented pictorially by interior of a rectangle and the other sets are represented by closed figures viz. circles or ellipses or small rectangles or some curved figures lying within the rectangle.

The Algebraic Properties of set operations are: Idempotent laws, Identity laws, Commutative laws, Associative laws, Distributive laws, De Morgan's Laws.

Application of sets. The theory of finite sets is, arguably, a definition of Combinatorics. In particular, certain combinatorial topics (e.g. Ramsey theory) have important direct analogues in "combinatorial" set theory. Since Axiomatic Set Theory is often used to construct the natural numbers (satisfying the Peano axioms, say) it is possible to translate statements about Number Theory to Set Theory. Indeed, a fairly robust theory of arithmetic has been developed for ordinals and cardinals. Fuzzy sets, or more precisely logic, are applied to topics in Information Theory and Artificial Intelligence since this gives a language in which to discuss decision-making.

Summary
In roster method of representing a set, all the elements are listed in the set. Two sets are said to be **equivalent sets** if the elements of one set can be put in one-one correspondence with the elements of the other set.
Two sets are said to be *equal sets* if every element of one set is in the other set and vice-versa.

Test 5
1. Question: Choose the function whose domain is the set of all reals except 0.
A) $y = ex + |x|$;   B) $y = \cos x$;   C) $y = -1x$;   D) $y = |x|$
Steps to derive:
1. From the given choices, the function $y = -1x$ is the only one, which is not defined at $x = 0$.
2. Hence, the domain of $y = -1x$ is $R - \{0\}$.
Hence the right answer is Option C.

2. Question: If f is a function from set A to set B, then which of the following is correct?
A) A is called domain of f and B is called codomain of f;
B) A is called range of f and B is called domain of f;
C) A is called codomain of f and B is called domain of f;
D) A is called domain of f and B is called range of f.
Steps to derive:
1. If f is a function from set A to set B then A is called domain of f and B is called codomain of f.
Hence the right answer is Option A

3. Question: Determine whether the relation represented by the set of ordered pairs is a function. Give the domain and range, if it is a function. (- 3, - 3), (- 3, - 4), (2, 5), (3, 6).
A) It is a function, domain: - 3, 2 and 3, range: 2, - 3, - 4, 5 and 6
B) It is a function, domain: - 3, 4 and 6, range: - 3, - 4, 5 and 6
C) It is a function, domain: - 3, 2 and 3, range: - 3, - 4, 5 and 6
D) It is not a function
Steps to derive:
1. A relation is a function if every input has exactly one output.
2. The relation is not a function because the input - 3 has two outputs: - 3 and - 4.
Hence the right answer is Option D

4. Question: Determine whether the relation represented by the set of ordered pairs is a function or not. Identify the domain and range, if it is a function.(1, 6), (2, 8), (3, 10), (4, 12)
A) it is a function; domain: {1, 2, 3} range: {6, 8, 10}
B) it is a function; domain: {2, 3, 4} range: {8, 10, 12}
C) it is a function; domain: {1, 2, 3, 4} range: {6, 8, 10, 12}
D) it is not a function.
Steps to derive:
1. A relation is a function if every input has exactly one output.
2. The given relation has exactly one output for each input. So, the relation is a function.
3. The domain is {1, 2, 3, 4} and range is {6, 8, 10, 12}.
Hence the right answer is Option C

Part 2. Grammar   VERBS, NOUNS, PREPOSITIONS FOLLOWED BY THE GERUND

The gerund is used after certain verbs. Example: *miss*: *I miss living in England.* The most important of these verbs are shown below. Those marked * can also be followed by a *that-clause*.

Example: She admitted breaking the window. *(Gerund)*
                          She admitted that she had broken the window. *(that-clause)*

acknowledge*- подтверждать	entail – влечь за собой	pardon -извинять, прощать
admit* - допускать; признавать	escape - совершать побег	postpone - откладывать
anticipate*-ожидать, предвидеть	excuse - извиняться	prevent - предотвращать
appreciate*-ценить, понимать	fancy* - воображать	propose*- предлагать
avoid - избегать, отменять	finish - завершать	recall*- возвращать
celebrate - праздновать	forgive - прощать	recollect* - вспоминать
consider -полагать, рассматривать	imagine*-представлять себе	remember - помнить
contemplate - разглядывать, ждать	involve - вовлекать	report* - сообщать
defer - задерживать, подчиняться	keep – держать, хранить	resent - возмущаться;
delay - задерживать	loathe - ненавидеть	resist - противостоять
deny - отрицать	mean* - значить, означать	risk - рисковать (чем-л.)
detest - ненавидеть, не терпеть	mention* - упоминать	save – спасать, экономить
dislike - не любить	mind – возражать, следить	stop - останавливаться
dread - бояться; опасаться	miss - потерпеть неудачу,	suggest* - предлагать
enjoy - наслаждаться	пропустить, скучать	understand*- понимать

Notes: *Appreciate* is followed by a *possessive adjective* and the gerund when the gerund does not refer to the subject. Compare : *I appreciate **having** some time off work.* (I'm having the time...)
          *I appreciate your **giving** me some time off work.* (You're giving me the time...)

Excuse, forgive, pardon can be followed by *an object* and the gerund or *for + object* and the gerund (both common in spoken English), or a *possessive adjective* + gerund (more formal and less likely to be said): *Excuse me **interrupting**. Excuse me for **interrupting**. Excuse my **interrupting**.*

Suggest can be used in a number of ways, but **BE CAREFUL**.

It is important not to confuse these patterns: **suggest/suggested (+possessive adjective)+G.:**
          He suggests/ suggested *going* to Glastonbury. – Он предлагает /предложил поехать в G.
          He suggested/suggests my *going* to Glastonbury.- Он предложил, чтобы я поехал в G.

Suggest/suggested + that-clause (where both *that* and *should* may be omitted):
  He suggests that I should go to New York.   He suggests I go to New York.
  He suggested that I should go to New York.   He suggested I went to New York.

Suggest/suggested + question word + infinitive: He suggested where to go.

Propose is followed by the gerund when it means *suggest*': John **proposed** going to the debate.
but by the infinitive when it means *'intend':* The Government proposes to **bring** in new laws.

Stop can be followed by a gerund or infinitive.

Dread is followed by the infinitive when used with *'think'*, in the expression *'I dread to think'*:

Prevent is followed: **EITHER** by a possessive adjective + gerund: *You can't prevent my **leaving**.*
          OR by an object + from + gerund: *You can't prevent me from **leaving**.*

The Gerund can follow the nouns with prepositions:

Astonishment at - удивление	Chance of - шанс	opportunity of – удоб.случай
Disappointment at - разочарование	Hope of – надежда	process of - процесс
Surprise at – удивление, сюрприз	Idea of – идея, мысль	right of - право
Apology for - извинение	Importance of – важность	way of - способ
Plan for - план	Intention of - намерение	
Preparation for - приготовление	Means of - средство	
Reason for – причина, основание	Method of - метод	
Experience in – опыт	Necessity of - необходимость	
Skill in – мастерство	Objection to - возражение	
Art of – искусство	Pleasure of - удовольствие	
Fear of – страх	Possibility of - возможность	
Habit of - привычка	Problem of - проблема	

The Gerund can be used in the function of the adverbial modifier after the prepositions:

1. on (upon) – по, после, **after** – после, **before** – перед, **in** – в то время как, при:
After saying this he left the room. On receiving the firm's reply we handede all the documents to our legal adviser. (After the prepositions on and after the Indefinite Gerund is usually used.)

2. for - за , **through** – из-за, **owing to -** благодаря, из-за:
Excuse me for being so late. He caught cold through getting his feet wet.

3. by – путем, при помощи: *He improved his article by changing the end. We were able to load the computer in10 hours by using powerful software.*

4. besides - кроме, **instead of -** вместо, **without** – без, **apart from** – помимо:
Besides being clever, he is very industrious. He left the room without waiting for a reply.

5. for the purpose of, with the object of, with a view to – с целью, для того чтобы:
A Polish delegation arrived in Kiev with the object of conducting trade negotiations.

6. without - без, **in case of , in the event of** – в случае если, **subject to** - при условии:
This offer is made subject to receiving your confirmation within 10 days.

7. Within the expressions: **to be against** – быть против, **to be for** – быть за, **to be on the point of** – как раз собираться сделать что-то, **to be far from** – далеко до чего-либо.
The negotiations are still far from being ended. I am against his leaving the company.

THE GERUNDIAL CONSTRUCTION

In the examples discussed the subject of the main verb is also the subject of the Gerund, but there are cases when the Gerund **is related to its own "subject",** expressed by a noun or pronoun:
We appreciate your helping us. – Мы ценим вашу помощь (**то, что** вы помогли).
We enjoyed the band's playing very much. – Нам очень понравилось **то, как** играл оркестр.
A gerundial construction is nearly always rendered in Russian by a clause, generally introduced by **"то, что", "тем, что", "как".**
The nominal element of the construction can be expressed in different ways:
1. If it denotes **a living being** it may be expressed by **a possessive pronoun** or a **noun in the possessive case.** *Do you mind my smoking? Our talk was prevented by Richard's coming back.*
When the nominal element consists of two or more nouns, possessive case **is not used:**
> *I object to Mary and Jane going out on such a stormy day.*
2. If the nominal element denotes **a lifeless thing** it is expressed by **a noun in the common case.**
> *Her thoughts were interrupted by the door opening gently.*

Part 3. Practical work.

Exercise 1. Translate the sentences from English into Russian. Keep in mind the verbs which cab be used with the gerund and the infinitive:
1. She **began** crying/to cry. When did you **begin** learning/to learn English? He **began** to realize that he had made a mistake. 2. It **started** raining. It **is starting** to snow. 3. How long will you **continue** working? He **continued** to live with his parents after his marriage. 4. He **stopped** smoking on his doctor's advice. He **stopped** to smoke. 5. The factory **has ceased** making bicycles. The old German Empire **ceased** to exist in 1918. 6. I **like** cooking. I **like** to cook my meals. He **doesn't like** swimming when the water temperature is below 18 degrees. 7. She **loves** having/to have a lot of dogs and young men around her. 8. I **dread** having to visit the dentist. I **dread** to think what may happen. 9. She **loathes** traveling by air. I **loathe** to put up at this hotel. 10. She **hates** getting to the theatre late. I **hate** to trouble you. 11. I don't **remember** hearing the legend before. He **remembered** to post the letter. 12. I **regret** being unable to help you. I **regretted** to have said that. 13. I **forgot** calling you the day before. **Don't forget** to call me tomorrow. 14. **Try** knocking at the back door if nobody hears you at the front door. **Try** to get here early. 15. I **prefer** walking to cycling. I **prefer** to wait here. 16. What do you **intend** doing/to do today? 17. I **propose** starting early/to start early. 18. I **am** always **afraid** of being bitten. He **was afraid** to tell his parents that he had broken the neighbour's window.

Exercise 2. Match the parts of sentences in A and B columns.

1. We very much appreciate
2. He strongly denied
3. We enjoyed
4. The chairman suggested
5. I agreed to delay
6. He should consider

a. my leaving till next day.
b. their meeting that afternoon.
c. her taking more responsibility.
d. the band's playing very much.
e. our postponing the meeting.
f. your helping us.

Exercise 3. Translate the sentences from English into Russian.

We appreciate John's helping us. I can't imagine her approving it. They resented my winning the prize. I think that's enough to start her worring. I can't excuse her not answering our invitation. I can't bear his interfering with what I do. Would you mind my smoking? Fancy her appearing at that very moment! I really miss his playing for our team. Excuse my asking, but does everyone in your family approve of your flying? Your coming has done him good. I wonder at Jolyon's allowing the engagement. I understand perfectly your wanting to leave. I didn't object to other people being there.

Exercise 4. Translate the sentences from Russian into English using gerundial phrases.

Я слышал о том, что он назначен директором большого завода. Я не возражаю против того, чтобы они приехали в Одессу. Я помню, что он мне говорил об этом несколько дней тому назад. Я настаиваю на том, чтобы вы ответили им немедленно. Я слышал о том, что его посылают в командировку в США. Вы можете рассчитывать на то, что он даст вам точную информацию. Нет надежды, что он закончит свою работу к вечеру. Извините, что я позвонил вам вчера так поздно. Вы не возражаете против того, чтобы я прочел этот рассказ вслух? Вы ничего не имеете против того, чтобы я курил здесь? Мы настаивали на том, чтобы они начали переговоры немедленно. Он возражает против того, чтобы собрание было назначено на понедельник. Вы ничего не имеете против того, чтобы он зашел к вам сегодня? Он отвечает за то, чтобы работа была закончена вовремя.

3.1. THE GERUND AND THE VERBAL NOUN

The Gerund can be easily confused with the verbal noun. But their meaning is not the same.

I like singing. Я люблю петь. (if it is a gerund)
I like singing. Я люблю пение. (if it is a noun)

Only a person speaking knows in this case what he means. In most cases we can distinguish between the gerund and the verbal noun in the following way:

The Gerund:

1. has tense and voice forms; so the forms *being done, having done, having been done* cannot be nouns;
2. can take a direct object; so an "ing" form followed by a direct object (*reading a letter*) cannot be a noun;
3. can be modified by an adverb; so an "ing" form modified by an adverb (*reading fast*) can not be a noun;

4. "ing" forms following the verbs *to begin, to stop, to go on, to keep, to continue* are mostly gerunds.

The Verbal Noun:

1. can be used in the plural:
Memorize the proverbs and sayings.
2. can have an article:
the banging of the door;
3. can be followed by a prepositional phrase in an attributive function:
the clicking of the clock;
4. can be modified by an adjective, an indefinite pronoun.

Exercise 1. Find the sentences in which: a) "ing" form is a gerund, b) a verbal noun.

You should think before *speaking*. After *finding* the new word in the dictionary, I wrote it down and went on *reading*. He spent much time on *the copying* of his literature lectures. What do you mean by *saying* that? The students found *the reading* of English newspapers rather difficult at first. Instead of *going* home after the University, the girls went to the bar. *The cleaning* of the room was done by the girls. *Working* in the garden is very good for the health of people. I stopped *knocking at* the door and began waiting for my father to come. She praised herself for *having made* a report. The old clock kept *ticking,* as if counting the seconds left before *the coming* of daylight.

UNIT 17

Part1. Text 17: ROBABILITY CONCEPTS AND THEOREMS OF PROBABILITY

Introduction. In our day to day life, we come across a lot of uncertainty of events. We wake up in the morning and check the weather report. The statement could be 'there is 60% chance of rain today'. This statement infers that the chance of rain is more than that having a dry weather. We decide upon our breakfast from a statement that "corn flakes might reduce cholesterol". What is the chance of getting a flat tyre on the way to an important apartment? And so on.

How probable an event is? We generally infer by repeated observation of such events in long term patterns. **Probability** is the branch of mathematics devoted to the study of such events.

Random Experiment and Sample Space. An experiment repeated under essentially homogeneous and similar conditions results in an outcome, which is unique or not unique but may be one of the several possible outcomes. When the result is unique then the experiment is called a deterministic experiment. Any experiment whose outcome cannot be predicted in advance, but is one of the set of possible outcomes, is called a random experiment. If we think an experiment as being performed repeatedly, each repetition is called a trial. We observe an outcome for each trial.

The set of all possible outcomes of a random experiment is called **the sample space**, associated with **the random experiment.**

Events. An event is the outcome or a combination of outcomes of an experiment. In other words, an event is a subset of the sample space. Whenever an outcome satisfies the conditions, given in the event, we say that the **event has occurred**.

The Types of Events are: Simple Event, Compound Event, Null Event, sure event or certain event, Complement of an Event, Algebra of Event, Mutually Exclusive Event, Exhaustive Event, Equally Likely Outcomes.

Probability of an Event. If a trial results in n-exhaustive, mutually exclusive and equally likely cases and m of them are favourable to the occurrence of an event A, then the probability of the happening of A, denoted by P(A), is given by: **P(A) = m/n.**

Important terms are: Statistical or Empirical Probability, Axiomatic Approach to Probability.

Theorems of Probability: Addition Rule of Probability: If A and B are any two events, then:
1) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.   2) $P(AC) = 1 - P(A)$.   3) $P(f) = 0$.

Multiplication Rule of Probability: Events are said to be **independent** if the occurrence of one event does not affect the occurrence of others. If A and B are two independent events, then $P(A \cap B) = P(A) \times P(B)$. This is known as Multiplication Rule of Probability. The converse is also true, that is if two events A and B associated with a random experiment.

Independent Experiment: Two random experiments are said to be independent if for every pair of events E and F, where E is associated with the first experiment and F is associated with the second experiment, the probability of simultaneous occurrence of E and F, when the two experiments are performed, is the product of the probabilities P(E) and P(F).

Random Variables and Probability Distributions: Let S be a sample space associated with a given random experiment. A real valued function X which assigns to each wi Î S, a unique real number, $X(wi) = xi$ is called **a random variable. Two types** of random variables are:
1. Continuous random variable; 2. Discrete random variable.

Let X be a discrete random variable which takes values x1, x2, x3,…xn where $pi = P\{X = xi\}$

Then **X:** x1 x2 x3 …xn and **P(X):** p1 p2 p3 … pn is called the probability distribution of x.

Summary: 1. Sample space: Set of all possible outcomes of a random experiment.

2. Event : An event of a random experiment is defined as a subset of the sample space.

3. Exhaustive outcomes: All the outcomes of a random experiment.

4. Random variable: A real valued function 'X' defined on the sample space is called a random variable. **5. Discrete random variable:** A random variable which can assume only finitely or infinitely many distinct values.

6. Continuous random variable: A random variable which can take any value over an interval is called a continuous random variable.

Part 2. Grammar: SUBJUNCTIVE MOOD OR CONDITIONALS
TYPE 1 CONDITIONAL SENTENCES
1. Form
In a *Type 1* conditional sentence, the tense in the **'if'** clause is the **simple present**, and the tense in the main clause is the **simple future**

'IF' CLAUSE (CONDITION)	MAIN CLAUSE (RESULT)
If + simple present	**Simple future**
If it **rains**	you **will get wet**
If you **don't hurry**	we **will miss** the train.

2. Function
In these sentences, the time is the **present or future** and the situation is **real**. They refer to a **possible condition** and its **probable result**. They are based on facts, and they are used to make statements about the real world, and about particular situations. We often use such sentences to give warnings: *If you **don't leave**, **I'll call** the police.*

*If you **don't drop** the gun, **I'll shoot**!*
If you *drop* that glass, it *will break*.
Nobody *will notice* if you *make* a mistake.
If I *have* time, *I'll finish* that letter.
What *will you do* if you *miss* the plane?

NOTE: We can use modals to express the degree of certainty of the result:
*If you **drop** that glass, it **might break**.*
*I **may finish** that letter if I **have** time.*

TYPE 2 CONDITIONAL SENTENCES
1. Form. In a *Type 2 conditional sentence*, the tense in the **'if'** clause is the **simple past**, and the tense in the main clause is the **present conditional**:

'IF' CLAUSE	MAIN CLAUSE
If + simple past	**Present conditional**
If it rained	you would get wet
If you went to bed earlier	you wouldn't be so tired.

2. Function
In these sentences, the time is **now or any time**, and the situation is **unreal**. They are **not** based on **fact**, and they refer to an **unlikely or hypothetical condition** and its **probable result.** The use of the past tense after **'if'** indicates **unreality.** We can nearly always add a phrase starting with "but", that expresses the real situation:
*If the weather **wasn't** so bad, we **would go** to the park (...but it is bad, so we can't go)*
*If I **was** the Queen of England, I **would give** everyone £100. (...but I'm not, so I won't)*
Examples of use:
1. To make a statement about something that is not real at present, but is possible:
*I **would visit** her if I **had** time. (= I haven't got time but I might have some time)*
2. To make a statement about a situation that is not real now and never could be real:
*If I **were** you, **I'd give up** smoking (but I could never be you)*
Examples: a. If I *was* a plant, I *would love* the rain.
b. If you really *loved* me, you *would buy* me a diamond ring.
c. If I *knew* where she lived, I *would go* and see her.
d. You *wouldn't need* to read this if you *understood* English grammar.
e. *Would he go* to the concert if I *gave* him a ticket?
f. They *wouldn't invite* her if they *didn't like* her
g. We *would be able* to buy a larger house if we *had* more money
NOTE**:** It is correct, and very common, to say "If I **were**" instead of "If I **was**".

TYPE 3 CONDITIONAL SENTENCES

1. Form
In a Type 3 conditional sentence, the tense in the **'if'** clause is the **past perfect**, and the tense in the main clause is the **perfect conditional**:

'IF' CLAUSE	MAIN CLAUSE
If + past perfect	**Perfect conditional**
If it had rained	you would have got wet
If you had worked harder	you would have passed the exam.

Type 3 conditional sentences, are truly ***hypothetical*** or ***unreal***, because it is now too late for the condition or its result to exist. There is always an unspoken "*but..."* phrase:

> If I ***had worked*** harder I ***would have passed*** the exam
> (but I didn't work hard, and I didn't pass the exam).
> If ***I'd known*** you were coming ***I'd have baked*** a cake
> (but I didn't know, and I haven't baked a cake).

NOTE: Both ***would*** and ***had*** can be contracted to ***'d***, which can be confusing. Remember that you **NEVER** use *would* in the **IF**-clause, so in the example above, "If I'd known" must be *"If I **had** known"*, and *"I'd have baked"* must be *"I **would** have baked.."*

Examples:
> a. If ***I'd known*** you were in hospital, I ***would have visited*** you.
> b. I ***would have bought*** you a present if ***I'd known*** it was your birthday.
> c. If ***they'd had*** a better goalkeeper they ***wouldn't have lost*** the game.
> d. If you ***had told*** me you were on the Internet, ***I'd have sent*** you an e-mail.
> e. ***Would you have bought*** an elephant if ***you'd known*** how much they eat?

1. Perfect conditional, continuous - Form
This tense is composed of two elements: the perfect condtional of the verb 'to be' (*would have been*) + the present participle (*base+ing*).

Subject	would have been	base+ing
I	would have been	sitting
We	would have been	swimming

2. Function
This tense can be used in Type 3 conditional sentences. It refers to the **unfulfilled result** of the action in the **if**-clause, and expresses this result as an **unfinished or continuous action**. Again, there is always an unspoken "but.." phrase:

Examples:
> If the weather had been better (but it wasn't), ***I'd have been sitting*** in the garden when he arrived (but I wasn't and so I didn't see him).
> If she hadn't got a job in London (but she did), she ***would have been working*** in Paris (but she wasn't).
> If I'd had a ball I ***would have been playing*** football.
> If I'd had any money ***I'd have been drinking*** with my friends in the pub that night.
> If I had known it was dangerous I ***wouldn't have been climbing*** that cliff.
> She ***wouldn't have been wearing*** a seat-belt if her father hadn't told her to.

Part 3. Practical work. Exercise 1. Complete the Conditional Sentences Type I, translate into Russian or Ukrainian. *Some friends are planning a party. Everybody wants to party, but nobody's really keen on preparing and organising the party. So everybody comes up with a few conditions, just to make sure that the others will also do something.*

1. If Caroline and Sue (to prepare) the salad, Phil (to decorate) the house.
2. If Sue (to cut) the onions for the salad, Caroline (to peel) the mushrooms.
3. Jane (to hover) the sitting room if Aaron and Tim (to move) the furniture.
4. If Bob (to tidy) up the kitchen, Anita (to clean) the toilet.
5. Elaine (to buy) the drinks if somebody (to help) her carry the bottles.
6. If Alan and Rebecca (to organize) the food, Mary and Conor (to make) the sandwiches.
7. If Bob (to look) after the barbecue, Sue (to let) the guests in.
8. Frank (to play) the DJ if the others (to bring) along their CDs.
9. Alan (to mix) the drinks if Jane (to give) him some of her cocktail recipes.
10. If they (to do) all their best, the party (to be) great.

Exercise 2. Complete the Conditional Sentences (Type I) by putting the verbs into the correct form, translate into Russian or Ukrainian.

1. If you (send) this letter now, she (receive) it tomorrow.
2. If I (do) this test, I (improve) my English.
3. If I (find) your ring, I (give) it back to you.
4. Peggy (go) shopping if she (have) time in the afternoon.
5. Simon (go) to London next week if he (get) a cheap flight.
6. If her boyfriend (phone / not) today, she (leave) him.
7. If they (study / not) harder, they (pass / not) the exam.
8. If it (rain) tomorrow, I (have to / not) water the plants.
9. You (be able/ not) to sleep if you (watch) this scary film.
10. Susan (can / move / not) into the new house if it (be / not) ready on time.

Exercise 3. Decide whether the following Conditional Sentences are Type I or Type II.

1. If they go to Australia, they will go whale-watching.
2. If she had a mobile, I would call her.
3. If Bob were here, he would have a solution for our problem.
4. If you move here, we will see each other more often.
5. You'll live longer if you stop smoking.
6. If Sarah didn't go with John, Anna would try to become his girlfriend.
7. I will only dance if they play my favourite song.
8. I wouldn't buy that computer if I didn't need it.
9. If she doesn't feel better tomorrow, she will see a doctor.
10. I'd lend you money if I had any.

Exercise 4. Complete the Conditional Sentences. Decide whether to use Type I or II.
To go, to order, to buy, to meet, to call, to be, not to have, not to know, not to be, not to say

1. If you do your homework now, we _____to the cinema in the evening.
2. If we _____the book now, we will have it tomorrow.
3. If I had more money, I _____a bigger car.
4. If I _____my favourite movie star, I would ask him for an autograph.
5. I _____ you if I need your help.
6. I would go swimming if the weather _____better.
7. If he _____time tomorrow, we will meet the day after.
8. If I were you, I _____what to do.
9. If we don't order the tickets soon, there _____any tickets left.
10. She _____that if she were your friend.

Exercise 5. Complete and translate the Conditional Sentences Type II.
Janine is a daydreamer. She imagines what would happen if she won the lottery.
1. If I (to play) the lottery, I (to have) a chance to hit the jackpot.
2. If I (to hit) the jackpot, I (to be) rich.
3. If I (to be) rich, my life (to change) completely.
4. I (to buy) a lonely island, if I (to find) a nice one.
5. If I (to own) a lonely island, I (to build) a huge house by the beach.
6. I (to invite) all my friends if I (to have) a house by the beach.
7. I (to pick) my friends up in my yacht if they (to want) to spend their holidays on my island.
8. We (to have) great parties if my friends (to come) to my island.
9. If we (to like) to go shopping in a big city, we (to charter) a helicopter.
10. But if my friends' holidays (to be) over, I (to feel) very lonely on my lonely island.

Exercise 6. Complete and translate the Conditional Sentences (Type II) by putting the verbs into the correct form. Use conditional I with would in the main clause.
1. If we (have) a yacht, we (sail) the seven seas.
 Model: If we **had** a yacht, we **would sail** the seven seas.
2. If he (have) more time, he (learn) karate.
3. If they (tell) their father, he (be) very angry.
4. She (spend) a year in the USA if it (be) easier to get a green card.
5. If I (live) on a lonely island, I (run) around naked all day.
6. We (help) you if we (know) how.
7. My brother (buy) a sports car if he (have) the money.
8. If I (feel) better, I (go) to the cinema with you.
9. If you (go) by bike more often, you (be / not) so flabby.
10. She (not / talk) to you if she (be) mad at you.

Exercise 7. Complete the Conditional Sentences. Decide whether to use Type I or II.
1. If they go to Washington, they (see) the White House.
2. If she (have) a hamster, she would call him Fred.
3. If he gave her a sweet, she (stop) crying.
4. If he (arrive) later, he will take a taxi.
5. We would understand him if he (speak) slowly.
6. Andy (cook) dinner if we buy the food.
7. I will prepare breakfast if I (wake up) early.
8. If they shared a room, they (fight) all day long.
9. If you hate walking in the mountains, you (enjoy / not) the tour.
10. Janet would go jogging if she (have / not) to do her homework.

Exercise 8. Complete the Conditional Sentences Type III.
What a match – your favourite team has lost again! So after the game, the supporters discuss what could have been different.
1. If the midfielders (to pass) the ball more exactly, our team (to have) more chances to attack.
2. If the forwards (to run) faster, they (to score) more goals.
3. Their motivation (to improve) if they (to kick) a goal during the first half.
4. The fullbacks (to prevent) one or the other goal if they (to mark) their opponents.
5. If the goalie (to jump) up, he (to catch) the ball.
6. If the referee (to see) the foul, he (to award) a penalty kick to our team.
7. Our team (to be) in better form if they (to train) harder the weeks before.
8. The game (to become) better if the trainer (to send) a substitute in during the second half.
9. If it (to be) a home game, our team (to win) the match.
10. If our team (to win) the match, they (to move) up in the league.

3.1. Text   THE OPEN WINDOW

(after H. Munro)

"My aunt will come down in a few minutes, Mr. Nuttel," said a girl of fifteen, showing him into the sitting-room. Mr. Nuttel was a young painter who had recently had a nervous breakdown. The doctors had told him that he should go away for a holiday. They warned him, however, against crowded resorts and recommended a complete rest in a quiet country-place. So here he was, in a little village, with letters of introduction from his sister to some of the people she knew.

"Some of the people there are quite nice," his sister had said to him. "I advise you to call on Mrs. Sappleton as soon as you arrive. I owe the wonderful holiday I had to her."

"Do you know many of the people round here?" asked the girl when they were sitting comfortably on the sofa.

"No, I'm afraid I don't", answered Mr.Nuttel. "I've never been here before. My sister stayed here four years ago, you know, and she gave me the letters of introduction to some of the people here."

"Then you know nothing about my aunt, do you?" asked the girl. "Only her name and address," said the visitor.

"Her great tragedy happened just three years ago," said the child. "Her tragedy?" asked Mr. Nuttel. "You may wonder why we keep that window wide open on an October afternoon," went on the girl, pointing to a Large French window. "It's quite warm for this time of year," said Mr. Nuttel. "But has that window anything to do with the tragedy?"

"Exactly three years ago my aunt's husband and her two young brothers walked out through that window. They went shooting and never came back. When they were crossing the river their boat probably turned over and they were all drowned. Their bodies were never found. That was the most horrible part of the tragedy." Here the girl stopped. There were tears in her eyes and she drew a handkerchief out of her pocket. "Three years have passed, but my poor aunt still thinks that they will come back some day, they and the little brown dog that was drowned with them, and walk in through that window just as they always did. That is why the window is kept open every evening till it's quite dark. Poor dear aunt, she can't understand that they've left for ever. She's growing worse day by day, so let me give you some advice. Don't be surprised at anything she says or does: she will start telling you all over again how they went out – her husband, with his coat over his arm, and her youngest brother, singing 'Bertie, why don't you come…' as she once told me. You know, sometimes, on quite evenings like this, I almost get a feeling that they will all walk in through that window, and the whole family will be gathered in here again." The young girl finished her sad story. There was a long pause, and Mr. Nuttel was glad when Mrs. Sappleton at last entered the room.

"I'm sorry I'm late," she said, "but I hope my niece has entertained you well."

"Yes, she's been very amusing," said Mr. Nuttel.

"Do you mind the open window?" asked Mrs. Sappleton.

"My husband and brothers will soon be home from shooting and they always come into the house this way." And she went on speaking gaily about shooting. After what Mr. Nuttel had just heard, he looked worried. "The doctors told me," he said, trying to change the subject, "to have a rest here and to avoid anything that would make me feel nervous."

"Did they?" said Mrs. Sappleton in a voice which showed that she was not at all interested in what Mr. Nuttel was saying. She never took her eyes off the open window and suddenly cried out: "Here they are at last! Just in time for tea. How tired they look."

Mr. Nuttel looked at the girl and saw that she was looking out through the open window with horror in her eyes. Mr. Nuttel turned round slowly in his seat, looked in the same direction and saw three figures walking across the garden towards the window. They all carried guns and one of them had a coat over his shoulder. A tired brown dog was following them. Noiselessly they approached the house, and then a young voice began to sing. "Bertie, why don't you come?" Mr. Nuttel seized his hat ran out of the house like mad.

"Here we are, my dear," said Mrs. Sappleton's husband, coming in through the window. "We've enjoyed ourselves very much. I wonder what made that gentleman run out so quickly when we

came up? Who is he?"   "A very strange young man, called Nuttel. He could only talk about his illness. He didn't say a single interesting thing. I don't understand why he ran out that way without saying good- bye," said his wife.

"I think it was the dog," said the niece calmly. "He told me that he was afraid of dogs. Once when he was attacked by a pack of dogs somewhere in India, he was so frightened that he started running like mad, and finding himself in a cemetery, climbed down into a newly-dug grave, where he had to spend the night. Since then he has always been afraid of dogs."

She was very good at inventing stories and did it artistically.

Vocabulary:

1. to show into - проводить в, ввести в	29. day by day - изо дня в день
2. a nervous breakdown - нервный срыв	30. advice - совет, советы
3. a painter -художник	31. news - новость, новости
4. to paint - рисовать	32 information - ведения, информация
5. to worn - предупреждать	1. progress - успех, успехи
6. a warning - предупреждение	2. over - над
7. a crowd -толпа	3. a feeling - чувство
8. a resort - курорт	4. to feel -чувствовать
9. to recommend - рекомендовать	5. to gather - собирать, собираться
10. quiet - тихий, спокойный	6. sad - грустный
11. an introduction - ведение, знакомство	7. to enter - входить в
12. a tragedy - трагедия	8. a niece - племяница
13. to point - указать на что-либо	9. a nephew - племяник
14. to owe - быть должным	10. to entertain - развлекать
15. a French window - стеклянная дверь	11. amusing - забавная
16. to go shooting - ходить на охоту	12. to enjoy oneself -наслаждаться
17. to turn over -перевернуть	13. once - однажды
18. a body - тело	14. to enter - входить в
19. horrible - ужасный	15. to amuse oneself - забавляться
20. a tear - слеза	16. to seize - хватать
21. to draw – тащить, рисовать, чертить	49. to run out - выбежать
22. a drawing - рисунок, чертеж	50. to be attacked - быть атакованым
23. a pocket - карман	51. to be frightened - быть напуганым
24. a handkerchief - носовой платок	52. a cemetery - кладбище
25. to pass - проходить, проезжать	53. newly-dug grave - свежевыкопанная могила
26. exactly -точно, ровно	54. artistically - артистически
27. an aunt - тетя	
28. gaily -весело	

UNIT 18
Part 1. Text 18:   LINEAR PROGRAMMING PROBLEMS (LPP)

Introduction The mathematical models which optimise (minimize or maximize) the objective function Z subject to certain condition on the variables is called a Linear programming problem (LPP).

During World War II, the military managements in the U.K and the USA engaged a team of scientists to study the limited military resources and form a plan of action or programme to utilize them in the most effective manner. This was done under the name 'Operation Research' (OR) because the team was dealing with research on military operation.

Linear Programming Problems (LPP)

The standard form of the linear programming problem is used to develop the procedure for solving a general programming problem.

A general LPP is of the form: Max (or min) $Z = c_1x_1 + c_2x_2 + \ldots + c_nx_n$, where $x_1, x_2, \ldots x_n$ are called decision variable.

Application Areas of Linear Programming

The Application Areas of Linear Programming are:
 1. Transportation Problem
 2. Military Applications
 3. Operation of System of Dams
 4. Personnel Assignment Problem
 5. Other Applications: a) manufacturing plants, b) distribution centres, c) production management and manpower management.

Basic Concept of Linear Programming Problem

Objective Function: The Objective Function is a linear function of variables which is to be optimised i.e., maximized or minimized. e.g., profit function, cost function etc. The objective function may be expressed as a linear expression.

Constraints: A linear equation represents a straight line. Limited time, labour etc. may be expressed as linear inequations or equations and are called constraints.

Optimisation: A decision which is considered the best one, taking into consideration all the circumstances is called an optimal decision. The process of getting the best possible outcome is called optimisation.

Solution of a LPP: A set of values of the variables $x_1, x_2, \ldots x_n$ which satisfy all the constraints is called the solution of the LPP..

Feasible Solution: A set of values of the variables $x_1, x_2, x_3, \ldots x_n$ which satisfy all the constraints and also the non-negativity conditions is called the feasible solution of the LPP.

Optimal Solution: The feasible solution, which optimises (i.e., maximizes or minimizes as the case may be) the objective function is called the optimal solution. Important terms here are: Convex Region and Non-convex Sets.

Mathematical Formulation of Linear Programming Problems

There are mainly four steps in the mathematical formulation of linear programming problem as a mathematical model. We will discuss formulation of those problems which involve only two variables.

   1. Identify the decision variables and assign symbols x and y to them. These decision variables are those quantities whose values we wish to determine.

   2. Identify the set of constraints and express them as linear equations/inequations in terms of the decision variables. These constraints are the given conditions.

   3. Identify the objective function and express it as a linear function of decision variables. It might take the form of maximizing profit or production or minimizing cost.

   4. Add the non-negativity restrictions on the decision variables, as in the physical problems, negative values of decision variables have no valid interpretation.

Advantages of Linear Programming

1) The linear programming technique helps to make the best possible use of available productive resources (such as time, labour, machines etc.)

2) In a production process, bottle necks may occur. For example, in a factory some machines may be in great demand while others may lie idle for some time. A significant advantage of linear programming is highlighting of such bottle necks.

Limitations of Linear Programming

a) Linear programming is applicable only to problems where the constraints and objective function are linear i.e., where they can be expressed as equations which represent straight lines. In real life situations, when constraints or objective functions are not linear, this technique cannot be used.

b) Factors such as uncertainty, weather conditions etc. are not taken into consideration.

Graphical Method of Solution of a Linear Programming Problem

The graphical method is applicable to solve the LPP involving two decision variables x1, and x2, we usually take these decision variables as x, y instead of x1, x2. To solve an LPP, the graphical method includes two major steps.

a) The determination of the solution space that defines the feasible solution (Note that the set of values of the variable x1, x2, x3,....xn which satisfy all the constraints and also the non-negative conditions is called the feasible solution of the LPP).

b) The determination of the optimal solution from the feasible region.

There are **two techniques** to find the optimal solution of an LPP: Corner Point Method and ISO-PROFIT (OR ISO-COST).

Some Exceptional Cases

We may come across LPP which may have no feasible (infeasible) solution or may have unbounded solution. If the intersection of the constraints is empty and the problem has no feasible solution. Therefore the given L.P.P has no solution.

Conclusion

The graphical method of solving an LPP is possible only if there are two decision variables (say x and y). This method is not suitable if there are three or more decision variables. In this case, there is a powerful method called 'simplex method'. The wide usage of liner programming helps in business and economics, to use the resources available in a planned and economical way. We have just learnt the basics of LPP, there is in fact a lot to learn in higher classes. A lot of research work is carried all over the world which is based on LPP.

Vocabulary:

to optimize – оптимизировать, optimization - оптимизация

to minimize or maximize - доводить до минимума или увеличивать до крайности, до предела

objective function - целевая функция

Linear programming problem (LPP) – проблема линейного программирования

decision variable - 1) искомая переменная 2) переменная решения

military managements – военное руководство

to engage a team of scientists – нанимать, привлекать группу ученных

to utilize – использовать, утилизировать

transportation problem - транспортная задача

military applications - применение в военных целях

personnel assignment problem - задача о назначении личного состава (вопрос кадров)

constraints - условия

feasible solution - допустимое решение; optimal solution - оптимальное решение

convex and non-convex region - выпуклая и невыпуклая область

non-negativity restriction – предел, ограничение неотрицательности

significant advantage – существенное преимущество

to take into consideration – принимать во внимание

simplex method - симплексный метод, симплекс-метод

Part 2. Grammar: MIXED CONDITIONAL SENTENCES

It is possible for the two parts of a conditional sentence to refer to different times, and the resulting sentence is a "mixed conditional" sentence. There are two types of mixed conditional sentence:

A. Present result of past condition:
1. Form
The tense in the **'if'** clause is the past perfect, and the tense in the main clause is the present conditional:

'IF' CLAUSE	MAIN CLAUSE
If + past perfect	**Present conditional**
If I had worked harder at school	I would have a better job now.
If we had looked at the map	we wouldn't be lost.

2. Function
In these sentences, the time is *past* in the *'if'* clause, and *present* in the main clause. They refer to an *unreal past condition* and its *probable result* in the *present.* They express a situation which is *contrary to reality* both in the past and in the present:

'*If I had worked harder at school'* is contrary to past fact - I didn't work hard at school, and '*I would have a better job now'* is contrary to present fact - I haven't got a good job.

If we had looked at the map (we didn't), *we wouldn't be lost* (we are lost).

Examples
I *would be* a millionaire now if I *had taken* that job.
If *you'd caught* that plane *you'd be dead* now.
If *you hadn't spent* all your money on CDs, you *wouldn't be broke*.

B. Past result of present or continuing condition.
1. Form
The tense in the *If-*clause is the simple past, and the tense in the main clause is the perfect conditional:

'IF' CLAUSE	MAIN CLAUSE
If + simple past	**Perfect conditional**
If I wasn't afraid of spiders	I would have picked it up.
If we didn't trust him	we would have sacked him months ago.

2. Function
In these sentences the time in the *If-*clause is *now or always*, and the time in the main clause is *before now*. They refer to an unreal present situation and its probable (but unreal) past result:

'If I wasn't afraid of spiders' is contrary to *present* reality - I **am** afraid of spiders, and '*I would have picked it up'* is contrary to *past* reality - I **didn't** pick it up.

'If we didn't trust him' is contrary to *present* reality - we **do** trust him, and *'we would have sacked him'* is contrary to *past* reality - we **haven't** sacked him.

Examples:
a. If she *wasn't afraid* of flying she *wouldn't have travelled* by boat.
b. *I'd have been able* to translate the letter if my Italian *was better*.
c. If I *was* a good cook, *I'd have invited* them to lunch.
d. If the elephant *wasn't* in love with the mouse, *she'd have trodden* on him by now.

If sentences with If + *not, unless and verbs.*

Unless means the same as if...not. Like *if*, it is followed by a present tense, a past tense or a past perfect (never by *'would'*). It is used instead of if + not in conditional sentences of all types:

Type 1: (Unless + present)

You'll be sick unless you *stop* eating. (= You will be sick if you don't stop eating)
I won't pay unless you *provide* the goods immediately. (= If you don't provide them I won't pay)
You'll never understand English unless you *study* this grammar carefully. (= You'll never understand if you don't study...)

Type 2: (Unless + past)

Unless he *was* very ill, he would be at work.
I wouldn't eat that food unless I *was* really hungry.
She would be here by now unless she *was* stuck in the traffic.

Type 3: (Unless + past perfect)

Our marketing director would not have signed the contract unless *she'd had* the company legal expert present.
I wouldn't have phoned him unless *you'd suggested* it.
They would have shot her unless *she'd given* them the money.

Conditionals : Unreal Past

The past tense is sometimes used in English to refer to an 'unreal' situation. So, although the tense is the past, we are usually talking about the present, e.g. in a Type 2 conditional sentence:
If an elephant and a mouse fell in love, they would have many problems.
Although *fell* is in the past tense, we are talking about a hypothetical situation that might exist now or at any time, but we are **not** referring to the past. We call this use the **unreal past.**
Other situations where this occurs are:

      1. after other words and expressions like *'if'* (*supposing, if only, what if*);
      2. after the verb *'to wish';*
      3. after the expression *'I'd rather..'*

1. Expressions like '*if*'
The following expressions can be used to introduce hypothetical situations:
- *supposing, if only, what if*. They are followed by a *past tense* to indicate that the condition they introduce is unreal:

      Supposing an elephant and a mouse *fell* in love? (= but we know this is unlikely or impossible)
      What if we *painted* the room purple? (= that would be very surprising)
      If only *I had* more money. (= but I haven't).

These expressions can also introduce hypothetical situations in the past and then they are followed by the *past perfect.*

Examples:
      If only I *hadn't kissed* the frog (= I did and it was a mistake because he turned into a horrible prince, but I can't change it now.)
      What if the elephant *had trodden* on the mouse? (She didn't, but we can imagine the result!)
      Supposing I *had given* that man my money! (I didn't, so I've still got my money now.)

2. The verb *to wish*

The verb *to wish* is followed by an 'unreal' past tense when we want to talk about situations in the present that we are not happy about but cannot change:

> I wish I *had* more money (=but I haven't)
> She wishes she *was* beautiful (= but she's not)
> We wish we *could* come to your party (but we can't)

When we want to talk about situations in the past that we are not happy about or actions that we regret, we use the verb *to wish* followed by the past perfect:

> I wish I *hadn't said* that (= but I did)
> He wishes he *hadn't bought* the car (= but he did buy it.)
> I wish I *had taken* that job in New York (= but I didn't, so I'm stuck in Bristol)

NOTE: When we want to talk about situations we are not happy about and where we want **someone else** to change them, we use *to wish* followed by *would + infinitive:*

> I wish he *would stop* smoking. (= I don't like it, I want **him** to change it)
> I wish you *would go* away. (= I don't want you here, I want **you** to take some action)
> I wish you *wouldn't squeeze* the toothpaste from the middle! (= I want you to change your habits.)

3. *I'd rather* and *it's time...*

These two expressions are also followed by an unreal past. The verb is in the past tense, but the situation is in the present.

When we want to talk about a course of action we would prefer someone else to take, we use *I'd rather + past tense*:   I'd rather you *went.*
> He'd rather you *called* the police.
> I'd rather you *didn't* hunt elephants.

NOTE: the stress can be important in these sentences, to show what our preference is:
*I'd rather **you** went* = not me,
*I'd rather you **went*** = don't stay
*He'd rather **you** called the police* = he doesn't want to
*He'd rather you called the **police*** = not the ambulance service

Similarly, when we want to say that *now* is a suitable moment to do something, either for ourselves or for someone else, we use *it's time + past tense*:

> It's (high) time I *went*.
> It's time you *paid* that bill.
> Don't you think it's time you *had* a haircut?

Part 3. Practical work.
Exercise 1. Complete the Conditional Sentences by putting the verbs into the correct form.
1. If you (study) for the test, you (pass) it.
Model: If you had studied for the test, you would have passed it.
2. If you (ask) me, I (help) you.
3. If we (go) to the cinema, we (see) my friend Jacob.
4. If you (speak) English, she (understand) .
5. If they (listen) to me, we (be) home earlier.
6. I (write) you a postcard if I (have) your address.
7. If I (not / break) my leg, I (take part) in the contest.
8. If it (not/ start) to rain, we (walk) to the museum.
9. We (swim) in the sea if there (not / be) so many sharks there.
10. If she (take) the bus, she (not / arrive) on time.

Exercise 2. Complete the Conditional Sentences (Type I, II or III) by putting the verbs into the correct form.

1. If they (have) time at the weekend, they will come to see us.
2. If we sneak out quietly, nobody (notice) .
3. If we (know) about your problem, we would have helped you.
4. If I (be) you, I would not buy that dress.
5. We (arrive) earlier if we had not missed the bus.
6. If I didn't have a mobile phone, my life (not / be) complete.
7. Okay, I (get) the popcorn if you buy the drinks.
8. If I (tell) you a secret, you would be sure to leak it.
9. She (go) out with you if you had only asked her.
10. I would not have read your diary if you (not hide) it in such an obvious place.

Exercise 3. Complete the conditional sentences (type I, II and III)
Fairytale "The Cat and the Mouse"

1. Once upon a time the cat bit the mouse's tail off. "Give me back my tail," said the mouse. And the cat said, "Well, I (give) you back your tail if you fetched me some milk. But that's impossible to do for a little mouse like you."
2. The mouse, however, went to the cow. "The cat (give / only) me back my tail if I fetch her some milk."
3. And the cow said, "Well, I would give you milk if you (get) me some hay. But that's impossible to do for a little mouse like you."
4. The mouse, however, went to the farmer. "The cat will only give me back my tail if the cow (give) me some milk. And the cow (only / give) me milk if I get her some hay."
5. And the farmer said, "Well, I would give you hay if you (bring) me some meat. But that's impossible to do for a little mouse like you."
6. The mouse, however, went to the butcher. "The cat will only give me back my tail if the cow (give) me milk. And the cow will only give me milk if she (get) some hay. And the farmer (only / give) me hay if I get him some meat."
7. And the butcher said, "Well, I would give you meat if you (make) the baker bake me a bread. But that's impossible to do for a little mouse like you."

Exercise 4. Put the verbs into the most suitable form to make correct conditional sentences (type I, II or III). Remember:
  * Type I expresses something that is likely.
  * Type II expresses something that is unlikely.
  * Type III expresses something that is impossible.

1. Do you like jazz music? Because if you (like) jazz, you (love) New Orleans.
2. Vanessa hates boat trips. But if she (hate / not) boat trips, she (enjoy) a riverboat cruise on the Mississippi.
3. I (do) a course in jazz dancing if I (have) more time. But unfortunately I don't have time.
4. If the founders and inhabitants of the city (hate) the King of France, they (call / not) the place Nouvelle-Orléans in honour of him.

Exercise 5. Study the following situations. In every sentence, the 'if' clause expresses a situation in the past (Type III). Decide, however, whether the consequences refer to the present (Conditional I) or past (Conditional II).

1. It didn't rain yesterday. So I had to water the plants yesterday.
   If it (rain) yesterday, I (water / not) the plants.
2. It didn't rain yesterday. So I am watering the plants now.
   If it (rain) yesterday, I (water / not) the plants now.
3. I went to bed late last night. So I am still tired now.
   If I (go) to bed earlier yesterday, I (feel / not) so tired now.

4. I went to bed late last Tuesday. So I was very tired the following day.
   If I (go) to bed earlier that Tuesday, I (feel / not) that tired the following day.
5. After a night out, I want to drive home now. I haven't drunk any alcohol.
   If I (drink) alcohol, I (drive / not).
6. After a night out last weekend, I drove home. I hadn't drunk any alcohol.
   If I (drink) alcohol, I (drive / not).
7. We won the match last week. So when we came home, we looked really happy.
   We (look / not) that happy if we (win / not) the match.
8. We've just won a match. So we look really happy now.
   We (look / not) that happy if we (win / not) the match.
9. My daughter is blamed for having done something. She tells me now that she didn't do it. I believe her. She (tell) me if she (do) it.
10. Last year, my daughter was blamed for having done something. She told me that she hadn't done it. I believed her. She (tell) me if she (do) it.

Exercise 6. Complete the conditional sentences. Remember to use the auxiliary verbs.
1. If it doesn't rain, we (can / go) swimming tomorrow.
2. If you train hard, you (might / win) first prize.
3. If we go to Canada next year, we (can / improve) our English.
4. I (may / go) to the disco in the evening if I do the washing-up now.
5. If we go on holiday next week, I (not / can / play) tennis with you.
6. If you see Gareth tomorrow, you (should / tell) him that you love him.
7. If my parents go shopping in the afternoon, I (must / look) after my little sister.
8. He (must / be) a good drummer if he plays in a band.
9. If you are listening to the radio after 10 pm, you (should / turn) the volume down.
10. If you like that shirt, you (can / have) it.

Exercise 7. Complete the following sentences. Note that you might have to use other tenses (active/passive voice) than required in the basic rules.
1. If I had more time, I (come) to your party yesterday.
2. Give the book to Jane if you (read) it.
3. If you hadn't lost our flight tickets, we (be) on our way to the Caribbean now.
4. If you (have) dinner right now, I'll come back later.
5. If we (set) off earlier, we wouldn't be in this traffic jam now.
6. What would you do if you (accuse) of murder?
7. If I hadn't eaten that much, I (feel / not) so sick now.
8. We would take another route if they (close / not) the road.
9. She only (sing) if she's in a good mood.
10. If she were sensible, she (ask) that question, by which she offended him so much.

3.1. Communicative skills.
Colloquial speech. Read the dialogue and draw your attention to the lexical and grammatical transformations in spoken language.
Natalie: Hey, **ya know what?** I was **flippin' through channels** last night, **an'** I saw our old classmate Chris Tyler.
Isabel: No way!
Natalie: Yeah.
Isabel: What was he doing?
Natalie: A commercial for his furniture store. It was good. He was really funny.
Isabel: Yeah, well, I'm not surprised, Chris always **cracked me up** in high school.
Natalie: Yeah. He **was a real riot**.

Новые выражения:

Hey, ya know what? - Это выражение используется для привлечения внимания собеседника. Обычно мы говорим это прямо перед тем, когда собираемся проинформировать нашего собеседника о чем-либо. Имеются также следующие вариации этого выражения:

You know what? Know what? You (wanna) know something?

Flip through channels. - Быстро переключать каналы в поисках чего-либо интересного по телевизору, прыгать с канала на канал.

Now way! - Выражает удивление. Является синонимом следующих словосочетаний: «I don't believe it!» (Не могу поверить), "How can that be?" (Как может такое быть?), "That's impossible!" (Это невозможно).

Crack (someone) up. - В разговорном Американском английском имеет следующее значение: «смешить кого-либо шутками или своим поведением»

To be a riot. - Быть смешным, забавным (говорят о людях или вещах).

Изменения в произношении: ***Hey, ya know what?*** "You" в разговорном Американском английском изменяется на "ya" в беглой речи.

I was flippin' through cannels… Глаголы, оканчивающиеся на "-ing" обычно теряют последнюю согласную "-g" в разговорной речи.

…an' I saw out old classmate "And" в беглой английской речи может терять букву "-d".

Изменения в грамматике: ***Hey, ya know what?,*** вспомогательные глаголы зачастую «выпадают» в разговорной речи. Полная версия вопроса звучит так: ***Do you know what?***

Yeah. - "Yeah" Обычно используется как замена для "yes" в неформальном английском. Также в разговорной речи "yes" может заменяться на "yep", "uh-huh" или "mm-hm".

3.2. Read and retell the text.

BIBI KHANYM AND THE ORIGIN OF THE MUSLIM VEIL

Almost seven centuries ago, in Central Asia, there lived a great king called Tamerlane. He was a mighty, powerful, conquering soldier, and his greatest ambition was that one day he would rule a massive empire stretching from the Atlantic Ocean in the west to the Pacific Ocean in the east. He made his imperial capital in the oasis city of Samarkand, which he planned to make the most beautiful city on earth. Many magnificent mosques were built and they were decorated with exquisite blue ceramic tiles on the outside, and with pure gold on the inside.

Tamerlane, like the great oriental king he was, had many wives, including a Chinese girl called Bibi Khanym. Now Bibi Khanym was the most beautiful of the Tamerlane's wives, and as the youngest, she was also the most senior. She was his favorite wife and she was deeply in love with him.

In order to demonstrate her great love of Tamerlane she decided to build a magnificent monument to honor him, while he was away fighting in a distant war. She engaged the best architect, who designed for her the most magnificent mosque you could imagine. And then she found the best master builder, who began work immediately. But as the weeks and months passed by, the master builder began to fall in love with Bibi Khanym. She resisted all his advances, but at last he threatened to leave the mosque unfinished unless she allowed him to kiss her just once. Bibi Khanym wanted the beautiful mosque finished more than anything else. She was expecting Tamerlane to return any day. So at last she agreed to let the master builder kiss her, just once.

But that was her terrible mistake. For so powerful was the master builder's love for Bibi Khanym that when he kissed her he left a permanent mark on her face.

King Tamerlane returned and saw the guilty mark on his wife's face. The master builder was executed immediately, and then, thinking that a woman's beauty can be a dangerous thing, Tamerlane ordered that from that day and for ever more all the women in the kingdom should never be seen in public without a veil to cover their faces.

Practice in translation	
A and 1/A are reciprocals.	All good things come to an end.
A and B can be read off from C .	An error may suggest a moral wrong; a mistake infers only misjudgment.
A answers for {A}.	
A belongs to {A}; so {A} = Ø as claimed.	At times time is up.
	Attain an optimum. Attract and inform.
A = A . Proof: Immediate. Obvious.	Augment your vocabulary and enhance your style.
A = A . Proof: Straightforward.	Avoid modifying modifiers.
A = A . Proof: Trivial.	Be grateful for advice. Be prepared to hardships.
A divides into A^2 two times.	Be interested in and zealous for mathematics.
A' reads: A prime.	Be obliged to ancestors.
A(x) changes with x.	Be simple by being concrete. Be staunch.
A(x) holds for all x.	Before launching into proofs, motivations are appropriate.
A is, as a matter of definition, a symbol.	
A prefers to integrate rather than differentiate.	Compromise among utility, clarity, clumsiness, and absolute precision.
A substantiates B.	Clear up a misunderstanding.
A's every subset is in P(A).	Compare integration with differentiation.
A's method is surpassed by that of B.	By method and with tools.
A′ is a token of the dual of A	Champion new ideas. Check limit cases.
Denote A by B.	Changes are omnipresent.
Derive corollaries from theorems.	Conform to and comply with conditions.
Derive immediate consequences.	Congratulate on occasions.
Describe a circle on the board.	Constants can assume arbitrary values.
A = A unless the contrary is stated.	Construe how to construct.
A = 0 has one and only one solution.	Draw attention to essentials.
A = 0 is contradicted by A = 1.	Drop down to a subsequence, if necessary.
A ∪{A } consists of A and the elements of A .	Elaborate on details.
	Emphasize the gist of your argument.
A ∪ {A } contains A .	Employ notions and concepts.
A ∈ {A } irrespective of whether or not B ∈{A}.	Emulate best authors.
	Fight sloth. Fill in details. Find words to describe ideas.
Assume A and begin to sum.	Ground your arguments on proofs.
Integrate by parts.	Hark and lo! Hope for the best.
Interchange the order of summation.	Have and lack properties.
It is common for A to do B.	Have no difficulties in understanding.
Distinguish A from B.	Contribute towards progress.
Doubt whether A = B and do not doubt that A = A .	Convenience dictates notation.
	Cope with tasks. Corroborate your statements.
A necessary and sufficient condition that A^2 be 0 is that A be 0.	Deal with, tackle, handle, address, and settle problems.
	Dispose of truisms and redundant assumption.
Combine A and B.	Flunk wiseacres and smart alecks.
Complications set in.	Divide and conquer.
A = {A }. On the contrary, A ≠ {A }.	Err on the side of hesitation.
Blob: •. Braces: { }. Brackets: [ ].	Examples conduce towards comprehension.
A ≠ 1 but A , however, vanishes (→ 0).	Destroy obstacles to progress.
	Analysis means breaking up of a whole into its parts to find out their nature.
{A} is obviously nonempty; in symbols,{A} ≠Ø	Dogmatism retards progress.
	Heighten your IQ.
Functions assume and take values.	Justify claims.
	Get rid of triteness.

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

Модульний тест № __   **Прізвище, ім'я та по батькові студента:**   **Факультет:**   **Спеціальність:**   **Дата тестування:**   **Загальна кількість балів (TOTAL = 100):**

№ 1

1. Визначте вірний варіант відповіді.

1.1. By the way, did she ask … … any papers yesterday?

A) they signed   B) them to sign   C) them have sung

1.2. The Sellers … to increase the prices of their monitors and keyboards.

A)   are reported

B)   won't be report

C)   could

1.3. If you accept these terms, we ... our prices.

A)   will reduce

B)   will have reduced

C)   reduce

1.4. Detectives investigating the robbery discovered that 20,000 worth of precious stones were missing.

A) Делегация, интересующаяся этой выставкой, обнаружила, что был украден экспонат ценой в 20 000 долларов.

B) Детективы, обнаружившие это ограбление узнали, что отсутствуют 20 сотен древних камней.

C) Детективы, расследующие эту кражу, обнаружили, что были украдены драгоценные камни на сумму 20 тысяч.

1.5. quoti____   A) ance ;   B) ter ;   C) ent ;   D) tore

2. Необхідно знайти помилку та перекласти.

  2.1. But for the rain, we should have gone down to the country today.

  2.2. If I run round the park every morning, I would keep fit too.

  2.3. If I had known that you was in hospital I will call on you.

3. Перекласти.

3.1. We may say that subtraction is the inverse operation of addition.

3.2. The devaluation of the pound sterling is known to have led to a rise of the prices of all goods imported into England.

3.3. Any operation is called a binary operation when it is applied to only two numbers at a time and gives a single result.

3.4. In New York City rents are incredibly high, due to the high demand for living space in an already crowded place.

3.5. A person bringing good news is always welcome.

4. Перекласти.

  4.1. Если бы я больше зарабатывал, я бы ездил отдыхать в Испанию каждое лето.

  4.2. Если бы он пришел вовремя, этого бы не случилось.

  4.3. Если бы не ты, я бы уже давно была дома.

  4.4. Будь я на вашем месте, я бы пришел пораньше.

  4.5. Не создавай проблем, сделай усилие и подружись с ней.(do or make)

  4.6.Кажется маловероятным, что их предложение примут.

  4.7. Решая такие уравнения, помните о порядке действий.

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

Модульний тест № __
Прізвище, ім'я та по батькові студента:
Факультет: **Спеціальність:**
Дата тестування:
Загальна кількість балів (TOTAL = 100):

№ 2

1. Визначте вірний варіант відповіді.
1.1. The IT Dpt. requires a mainboard this week. They expect this mainboard… soon.
A)   to deliver
B)   to be delivered
C)   to have been delivered
1.2. I have never heard Helen … .
A)   sang   B)   sing   C)   singing
1.3. We've just contacted Frank and Co. Their prices …to be reduced in a week.
A)   is said
B)   are supposed
C)   may be think
1.4. He must be working in the office now.
A)   Він повинен зараз працювати в офісі.
B)   Він скоро буде працювати в офісі.
C)   Він напевно зараз працює в офісі.
D)   Він обов'язково буде працювати в офісі.
1.5.   to main___   the computers in class   A) ten;   B) tain;   C) tor   D) cation

2. Необхідно знайти помилку та перекласти.
 2.1. But for computer, you can prepare the contract
 the other day.
 2.2. If he has known how dull the film was, I would
 not have gone to the cinema.
 2.3. What would you have done under yesterday's
 situation if you were the Rector of the University?

3. Перекласти.
3.1. The opening of the conference is understood to have been
fixed for the 15th of December.
3.2. The machines that can take in, record and store information
by themselves are called automatic computers.
3.3.The degree to which computers take over human functions may
Seem astonishing.
3.4. It is stated that energy equals mass multiplied by the square
of the speed of light.
 3.5. The information is being checked.

4.   Перекласти.
 4.1. Если бы дорога была лучше, мы бы доехали значительно
 быстрее.
 4.2. Если бы ты пригласил ее на вечеринку, она бы пришла с
 удовольствием.
 4.3. Если бы не тесные туфли, я бы получила огромное удовольствие
 от прогулки.
 4.4. Будь ты немного старше, мы бы поженились.
 4.5. Сообщают, что экспедиция уже прибыла.
 4.6. Сделать все возможное и получить прибыль.   (make or do)
 4.7.Лекция, наверное, будет интересной.

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

Модульний тест № __
Прізвище, ім'я та по батькові студента:
Факультет: **Спеціальність:**
Дата тестування:
Загальна кількість балів (TOTAL = 100):

№ 3

1. Визначте вірний варіант відповіді.

1.1. They are expected … a reply today.
A)   sent
B)   to have been sent
C)   to send

1.2. We are afraid that your prices are too high and they are not ... to us.
A)   arrange
B)   acceptable
C)   fit

1.3. … everything, I want to tell you how sorry I am.
A)   Explained
B)   Explaining
C)   Having explained

1.4. He was told that in a month he would have to buy supplies.
A) Він сказав, що через місяць буде купувати сировину.
B) Його повідомили, що через місяць він повинен купити сировину.
C) Його повідомили, що купування продукції перенесено на наступний місяць.

1.5. paren ___ es   A) sep;   B) tesi;   C) thes

2. Необхідно знайти помилку та перекласти.
  **2.1. If I understand what a bad driver you were I
  wouldn't have come with you.**
  2.2. Had I time, I will come over.
  **2.3. If it were not for your help, I won't be able to
  finish my work in time.**

3. Перекласти.
**3.1. The price of flour in England is stated to have risen
by 11.6 per cent in May.**
**3.2. When we are multiplying the multiplicand by the multiplier
we get the product as a result.**
**3.3. How many digits do we use in our Hindu-Arabic system of
numeration?**
**3.4. While working on these two facts he found that there was
a certain correspondence between them.**
3.5. We are trying to find some additional facts.

4. Перекласти.
  4.1. Случись так, что он позвонит, сообщи ему все.
  4.2. Предположим, они прислали бы вам e-mail, что бы вы ответили?
  **4.3. Как бы вы решили эту проблему, если бы вам
  пришлось заняться ею?**
  4.4. Будь я на вашем месте, я бы предупредил ее.
  4.5. Я случайно был в офисе, когда он зашел.
  4.6. Постирать, погладить и помыть посуду. (do or make)
  4.7. Проблема решается успешно.

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

Модульний тест № ___
Прізвище, ім'я та по батькові студента:
Факультет: **Спеціальність:**
Дата тестування:
Загальна кількість балів (TOTAL = 100):

№ 4

1. **Визначте вірний варіант відповіді.**
1.1. He intended … go with him to India.
   A) she to
   B) me to
   C) I
1.2. … three times seriously wounded, he was no longer fit for active service.
   A) Being
   B) Having been
   C) While have been
1.3. The steamer, which ___ to be approaching Istanbul, ___ to arrive in Odessa on 21st May.
   A) believe, is sure;   C) is believed, is sure;
   B) are sure, were believed;   D) is sure, to be believed
1.4. He ____ to look in that direction and saw a man run out of the house.
   A) happened;   C) is happened;
   B) happens;   D) was happening
1.5. In the expression five multiplied ___ two, the 5 and the 2 will be _____.
 A) at, product;   B) ex, remainders;   C) on, multiplicands;   D) by, factors

2. Необхідно знайти помилку та перекласти.

2.1. If it hadn't been for me, they would never found the place.
2.2. If he were not so absent-minded, he will not miss the train yesterday.
2.3. Should he came, ask him to wait for me.

3. Перекласти .

3.1. Many million tons of cost reserves are known to exist in that district.
3.2. The mine is considered to be the best in the district.
3.3. He changed the signs in both parts of the equation.
3.4. Since the machine is not complicated they could easily operate it.
3.5. He does not wish to speak about the disadvantages of his method of research right away.

4. Перекласти .

4.1. Даже если бы он очень изменился, я бы узнал его.
4.2. Если бы не его нога, он тоже принял бы участие в этих соревнованиях.
4.3. Будь я на вашем месте, я бы не рисковал жизнью.
4.4. Я не закончу эту работу к вечеру, даже если вы поможете мне.
4.5. Сделать услугу и произвести хорошее впечатление. (make or do)
4.6. Теория относительности и Брауновское движение.
4.7. Умножение и деление – обратные операции.

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

№ 5

1. Визначте вірний варіант відповіді.

1.1. You … the advertisement about the new model of compressor, haven't you?

A)   have to   C) are reading
B)   have read   D) must have read

1.2. The house is likely to … at the beginning of the 19th century.

A)   was built   C) had been built
B)   build   D) have been built

1.3.The sellers refused to reduce the prices … and the buyers declined the offer.

A)   quoting   B) having been quoted   C) quoted

1.4. The captain watched the steamer being unloaded.

A) Капитан наблюдал, как матросы разгружали пароход.
B) Капитан наблюдал, как разгружали пароход.
C) Капитан наблюдал, как пароход был разгружен.

1.5. The first experiment proved to be a … .

   A) success   B) best price   C) producer

2.   Необхідно знайти помилку та перекласти.

2.1. In case I won't find her at home, I'll leave her a note.
2.2. She's getting fat. If she doesn't eat much sweet, she might have lost weight.
2.3. But for his sore throat he will speak at the meeting.

3. Перекласти.

3.1. A security deposit of one month's rent is usually necessary, and tenants must typically sign a lease for a term on one year.
3.2. The cargo does not seem to have been damaged by the storm.
3.3. How many high-speed computers are being operated at your faculty.
3.4. There is no correspondence between the results obtained by two groups of researchers.
3.5. The invention is considered to be of great importance in mathematics.

4. Перекласти.

4.1. Если бы не плохая погода, мы бы поехали на пикник.
4.2. Если бы у меня был электронный словарь Лингво, я бы закончил перевод сегодня.
4.3. В случае, если он вернется, попросите его забрать все эти документы.
4.4. Будь она в Одессе, она бы решила эту проблему за 2 минуты.
4.5. Забронировать место на самолет и строить планы на будущее.(make or do)
4.6. Он, по-видимому, удовлетворен результатом работы.
4.7. Известно, что Ломоносов был самым блестящим ученым своего времени.

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

№ 6

1. Визначте вірний варіант відповіді.

1.1. This _____to be the right decision.
    A) don't seem
    B) doesn't seem
    C) is not seem

1.2. This system of notation _____ to be widely used in the research work.
    A) are said
    B) were suggested
    C) is being
    D) was considered

1.3. Laser is known _____ in medicine.
    A) have been used   C) to be used
    B) was used   D) to use

1.4. Having studied the question in detail, he was able to answer all the questions asked.

A) Изучая вопрос детально, он смог бы ответить на все вопросы, которые ему зададут.

B) Изучив вопрос подробно, он смог ответить на все заданные вопросы.

C) Изучив вопрос обстоятельно, он мог получить ответ на все задаваемые им вопросы.

1.5. o … pations   A) qu;   B) ccu;   C) cu

2. Необхідно знайти помилку та перекласти.

  2.1. I wouldn't have believed it until I see it with my own eyes.

  2.2. Had she been more attentive, the accident hadn't happened.

  2.3. But for the final scene the picture were quite good.

3. Перекласти.

3.1. The remainder of the goods under the contract is likely to be shipped in the first half in September.

3.2. Imports of copper into the UK in October were stated to be 222,097 tons.

3.3. Renters may be asked for personal and job references, and banking and credit histories.

3.4. The position of every digit is being changed.

3.5. In a few months' time they are certain to put into operation another network database.

4. Перекласти.

4.1. Если бы не я, вы никогда бы не починили компьютер и не установили бы эту программу.

4.2. Если бы не ваша помощь, я бы не нашел этой улицы.

4.3. Появись он вовремя, мы бы не опоздали на самолет.

4.4. Он настаивал на том, чтобы решение было принято.

4.5. Поднять шум и пожаловаться на соседей (make or do).

4.6. Он, по-видимому, очень много читал по этому вопросу.

4.7. Говорят, что этот дом был построен 200 лет назад.

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

Модульний тест № __
Прізвище, ім'я та по батькові студента:
Факультет: **Спеціальність:**
Дата тестування:
Загальна кількість балів (TOTAL = 100):

№ 7

1. Визначте вірний варіант відповіді.
1.1. While we were crossing the bridge, we saw Mr. Deendem … with an old man.
A) having talked   **C) told**   **E) talking**
B) talked   **D) talk**
1.2. … three times seriously wounded, he was no longer fit for active service.
A) Being
B) Having been
C) While have been
1.3. The teacher told the student to look up the rule himself as it … many times.
A) was explained
B) had been explained
C) was being explained
1.4. The house appears ... in the eighteenth century.
A) was built   **C)** to have built
B) to build   **D)** to have been built
1.5. to be … display   A) at   B) in   C) on   D) for

2. Вам необхідно визначити те слово чи словосполучення, що вжито невірно.
2.1. The secretary brought a few more letter.
2.2. We expected the Harrisons arrived later than usual.
2.3. His last play was the great success.

3. Перекласти з української або російської мови на англійську.

3.1. Могли бы мы обсудить этот вопрос детально?	
3.2. Сказав это, он вышел из комнаты.	
3.3. Получив необходимые сведения, продавцы послали покупателям свое предложение.	
3.4. Исправлять дефект в машине было нелегко.	
3.5. Вы можете повесить более яркую лампу прямо у меня над головой?	

4. Перекласти з англійської на українську або російську мови.

4.1. "Every corner is full. Now, don't bother me any more."	
4.2. The buyers wished the goods to be discharged onto berth.	
4.3. What impression did their new testing department make on you?	
4.4. The porter's smiling face appeared in the doorway.	
4.5. The preliminary tests show that the compressors meet all your technical requirements.	
4.6. He took my leaflets without asking for permission.	
4.7. Payment for the goods bought was made in Kyiv.	

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

Модульний тест № __
Прізвище, ім'я та по батькові студента:
Факультет: **Спеціальність:**
Дата тестування:
Загальна кількість балів (TOTAL = 100):

№ 8

1. Визначте вірний варіант відповіді.

1.1. You … the advertisement about the new model of computer, haven't you?
A)   have to
B)   have read
C)   are reading
D)   must have read

1.2. … that the river was rising rapidly, they turned back.
A)   Has been warned   C) Have been warned
B)   Having been warned   D) When warned

1.3. The sellers refused to reduce the prices … and the buyers declined the offer.
A)   quoting
B)   having been quoted
C)   quoted

1.4. The captain watched the steamer being unloaded.

A) Капитан наблюдал, как матросы разгружали пароход.

В) Капитан наблюдал, как разгружали пароход.

С) Капитан наблюдал, как пароход был разгружен.

1.5. ins...tion   A) ala   B) pera   C) ula   D) um

2. Вам необхідно визначити те слово чи словосполучення, що вжито невірно.

2.1. When the representative <u>entered</u> the office he <u>saw</u> that the personal <u>discussed a news.</u>

2.2. <u>What do</u> your Chief Engineer <u>expect you do</u> at the plant?

2.3. While discharging the goods the workers came upon a number of bags damaging by sea water.

3. Перекласти з української або російської мови на англійську.

3.1. Секретарь отправил подписанные директором письма.	
3.2. Хочет ли он, чтобы мы помогли ему?	
3.3. Наша фирма рекламирует новые модели станков.	
3.4. Не получая от нее писем, он послал ей телеграмму.	
3.5. Замена мотора может вызвать задержку в поставке.	

4. Перекласти з англійської на українську або російську мови.

4.1. The goods were ready for shipment, having been inspected and tested by the buyer's inspectors.	
4.2. All the exhibits that are on display in our pavilion are for sale.	
4.3. Most of Mark Twain's early writings sparkle with gay humour.	
4.4. I was to change trains there and take the sleeper.	
4.5. The goods were transshipped in Riga, and the expenses incurred were paid by the sellers.	
4.6. As a result new business contacts were established.	
4.7. The quality of the goods is in accordance with the specification enclosed.	

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

№ 9

1. Визначте вірний варіант відповіді.

1.1. The firm ... the second lot of the goods ahead of schedule.
 A) had shipped   B) has shipped   C) has been shipping

1.2. The contract contains a clause _____ that all disputes from time to time _____ under it, should be referred to arbitration.

A) provided of;   arose
B) providing;   arising
C) has provided; arised
D) having provided; being arisen

1.3. The day before yesterday all the preliminary tests _____.
A) have been done.   C) are done.
B) was done.   D) were done.

1.4. Having studied the question in detail, he was able to answer all the questions asked.

А) Изучая вопрос детально, он смог бы ответить на все вопросы, которые ему зададут.

В) Изучив вопрос подробно, он смог ответить на все заданные вопросы.

С) Изучив вопрос обстоятельно, он мог получить ответ на все задаваемые им вопросы.

1.5. to be crowded …   A) of   B) with   C) over   D) up

2. Вам необхідно визначити те слово чи словосполучення, що вжито невірно.

2.1. Very important business talks will be hold at our office last week.

2.2. A lot of places of interest was seen by our delegation.

2.3. If we go to the performance we would be very happy.

3. Перекласти з української або російської мови на англійську.

3.1. Я слышал, как она рассказывала ему об этом.	
3.2. Он, повидимому, очень много читал по этому вопросу.	
3.3. Нам придется примириться с этим.	
3.4. Он попросил, чтобы его сыну послали телеграмму.	
3.5. Получив весь материал, который ему был нужен, он начал писать статью.	

4. Перекласти з англійської на українську або російську мови.

4.1. Buyers and sellers have full knowledge of the prices quoted in the market.	
4.2. The bridge seized by the enemy the day before was retaken by our troops.	
4.3. I have looked through the list of prices sent.	
4.4. I was eager to say a few words to my companion, but I changed my mind.	
4.5. I must say, she is an efficient interpreter.	
4.6. It could be nothing but the defect in the insulation.	
4.7. The letter being typed by the typist must be sent off as soon as it is ready.	

ОДЕСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ ім. І.І. МЕЧНИКОВА

№ 10

1. Визначте вірний варіант відповіді.
1.1. While … the pronunciation of the words we learned their meaning.
   A) learnt   B) learning   C) having learned
1.2. The steamer met with rough weather while … the Indian Ocean.
   A) having crossed   C) crossing
   B) being crossed   D) crossed
1.3. He has made … progress in his studies for the last two months.
   A) many   C) a number of
   B) little   D) a few   E) a big
1.4. He wanted the article to be translated immediately.
A) Він хотів перекласти статтю негайно.
B) Він хотів, щоб статтю було перекладено негайно.
C) Він хотів, щоб ми переклали статтю негайно.
D) Він наказав, що статтю треба перекласти негайно.
1.5. compart …   A) man   C) men
                                        B) ment   D) meant

2. Вам необхідно визначити те слово чи словосполучення, що вжито невірно.
2.1. I <u>recognized</u> you the minute I <u>fixed</u> my <u>eyes to you</u>.
2.2. His smile <u>was</u> <u>something</u> she <u>has</u> <u>never</u> <u>seen</u> <u>before</u>.
2.3. <u>Ms.</u> Wormwood <u>told</u> <u>to</u> <u>her</u> <u>pupils</u> that it <u>was</u> wonderful.

3. Перекласти з української або російської мови на англійську.

3.1. Я буду вам благодарен, если вы предоставите мне место, любое подойдет.	
3.2. Платеж за поставленное оборудование будет произведен в июне.	
3.3. Вернувшись из экспедиции, он сделал очень интересный доклад.	
3.4. Какое впечатление произвел на вас наш новый отдел тестирования?	
3.5. Могу ли я оказать вам какую-либо услугу?	

4. Перекласти з англійської на українську або російську мови.

4.1. The leaves lying on the ground reminded us of autumn.	
4.2. Don't you like the way you are being served? And all for the same fare.	
4.3. We need efficient stand-attendants and guides for the fair that will be held in a few months.	
4.4. Mr. Buck said that the mining equipment met their requirements.	
4.5. A couple of berths are entirely at your disposal.	
4.6. The buyers agreed to pay the amount of the invoice against the documents presented.	
4.7. The contents of the house were sold after her death.	

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6. http://www.GMATClub.com
7. http://www.tenet.edu/teks/math/clarifying/algebra1/alg1assess.pdf
8. www.nctm.org
9. www.illuminations.nctm.org.

Practical work:

Exercise 1. Замените форму притяжательного падежа существительным с предлогом of:

My University's library, our Dean's study, the professor's lecture on differential calculus, Odessa's city hall, yesterday's appointment, our group's success, their team's victory, today's meeting, the Pacific's currents, the Sun's rays, the Moon's surface, her Italy's shoes, a mile's distance, a fortnight's leave, for safety's sake, the mathematician's drawings, this programmer's error, the analyst-programmer's conclusion, the financial expert's opinion, the boss's signature.

Exercise 2. Переведите на английский язык:

Двухчасовый перелет, месячная зарплата, экипаж корабля, решение украинского правительства, лучший Оперный театр нашей страны, Одесские улицы и дороги, ошибки студентов, результат вчерашнего матча, карьера системного программиста в компании Майкрософт, компьютерные игры, ответ наших клиентов, мнение его адвоката, приказ ректора, задание нашего преподавателя, прибытие теплохода, отчет факультета ПМ.

Exercise 3. Переведите на английский язык:

Машина мистера Брауна в гараже, а наша напротив дома. Вчера они взяли наши журналы и оставили нам свои. Этот чемодан на мой, а их. Ее родители живут в центре города, а его – на окраине. Я знаю ваш адрес, но я не знаю их адрес. Это мое мнение, я вижу, оно отличается от твоего. Это ваша записная книжка, а это его, но где же моя? Она взяла мои руки в свои. Он, должно быть, перепутал ключи и взял ключ соседа вместо своего. Твой билет на столе, а ее билет – в сумке. Результаты показали, что наш план был более правильным, чем их. Самое лучшее предложение – ваше. Где твоя фотография? – Она в альбоме. Он слишком много о себе думает. Ты можешь сделать это самостоятельно? Она живет одна, ее дети в Германии. Веди себя прилично!