МИКОЛАЇВСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ
ІМЕНІ В.О. СУХОМЛИНСЬКОГО

ФІЛОЛОГІЧНИЙ ФАКУЛЬТЕТ
КАФЕДРА ЗАГАЛЬНОЇ ТА ПРИКЛАДНОЇ ЛІНГВІСТИКИ

Р. В. Майборода

ІНОЗЕМНА МОВА ЗА ПРОФЕСІЙНОЮ СПРЯМОВАНІСТЮ ЗАВДАННЯ ДЛЯ САМОСТІЙНОЇ РОБОТИ

Методичні рекомендації
для проведення самостійної роботи
з іноземної мови
для студентів математичних спеціальностей

Миколаїв - 2021

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Рекомендовано до друку навчально-методичною радою Миколаївського національного університету імені В. О. Сухомлинського (протокол № 7 від 25.05.2021)

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ПЕРЕДМОВА

Головна задача вищої освіти – формування творчої особистості спеціаліста, що саморозвивається, займається самоосвітою та інноваційною діяльностю. Немає ніякого сенсу, якщо знання передаються тільки у готовому вигляді від викладача до студента. Основною умовою сучасної освіти є перехід студента від пасивного отримувача знань до активного, у наслідок чого він вміє формулювати проблему, аналізувати шляхи її вирішення, знаходити оптимальний результат та доводити його правильність. Реформа вищої освіти, яка відбувається зараз, пов'язана з переходом від навчання до освіти. У даному процесі самостійна робота студентів стає не лише важливою формою освітнього процесу, а повинна стати її основним чинником.

Центр уваги зосереджується на активних методах оволодіння знаннями, розвитку творчих здібностей студентів, переході від поточного до індивідуалізованого навчання з урахуванням потреб та можливостей особистості. Задача не тільки в тому, щоб збільшити самостійні часи на опрацювання. Підсилення ролі самостійної роботи студентів означає принципіальний погляд на організацію учбово-виховного процесу, який налаштовано так, щоб розвивати вміння вчитися, формувати у студента здібності до саморозвитку, творчого застосування отриманих знань, налагодити способи адаптації до професійної діяльності у сучасному світі.

Дослідники, які займаються проблемою, яка нас цікавить, стосовно вищої школи (С. І. Архангельський, М. Г. Гарунов, У. Я. Голант, Б. Г. Іоганзен, С. І. Зінов'єв, А. Г. Молібог, Р. А. Німазов, Н. Д. Нікандров, П. І. Підкасистий та інші), вкладають у термін «самостійна робота» різний зміст. Так, поняття «самостійна робота» трактується як самостійний пошук необхідної інформації, набуття знань, використання цих знань для рішення учбових, наукових та професіональних задач (С. І. Архангельський); як діяльність, яка складається з різних елементів: творчого сприйняття та осмислення учбового матеріалу у ході лекції, підготовки до занять, екзаменам, залікам, виконання курсових та

дипломних робіт (А. Г. Молібог); як різнівиди індивідуальної, групової та пізнавальної діяльності студентів на заняттях або у поза аудиторний час без безпосереднього керівництва, але під спостереженням викладача (Р. А. Нізамов). Організація самостійної роботи у вищій школі розглядається як система мір по вихованню активності та самостійності як рис особистості (Б. Г. Іоганзен). Самостійна робота розуміється також деякими авторами як система організації педагогічних умов, які забезпечують управління учбовою діяльністю, яка відбувається під час відсутності викладача (В. Граф, І. І. Ільясов, В. Я. Ляудіс). Іноді самостійна робота ототожнюється з самоосвітою (С. І. Зінов'єв).

Як видно з наведених вище визначень, самостійна робота з одної сторони – стимулю активність, самостійність, пізнавальний інтерес студентів, що надає поштовх до подальшого підвищення кваліфікації, а з другої – забезпечує керівництво самостійною діяльністю студентів.

Задачею сьогодення є скорочення аудиторних годин та зміщення акценту на самостійну підготовку студента. Досвід викладачів свідчить, що вивчення будь-якої програмної теми може бути продовжено у самостійній роботі. Самостійні заняття сприяють подальшом вдосконаленню вмінь та навичок студентів.

Результативність діяльності залежить від систематичної організації самостійної роботи. Завданнями викладачів є допомага у рішенні практичних загальноосвітніх та виховних задач.

Актуальність самостійної роботи у тому, що вона цілеспрямовано формує комунікативні вміння та навички, проявляє турботу про розширення кругозору студентів, виховує естетичне відношення до літератури країни, мова якої вивчається, та до самої мови.

Позааудиторна робота студентів – це запланована учбова, учбово-дослідна, науково-дослідна робота студентів, яка виконується у

позааудиторний час за завданням або під методичним керівництвом викладача, але без його безпосередньої участі.

Об'єм самостійної роботи студентів визначається державним освітнім стандартом. Самостійна робота студентів є обов'язковою для кожного студента і визначається учбовим планом.

Під час визначення змісту самостійної роботи студентів слід враховувати рівень самостійності абітурієнтів та вимоги до рівня самостійності випускників для того, щоб за період навчання був досягнутий необхідний рівень.

Для організації самостійної роботи необхідні наступні умови:

- готовність студентів до самостійної праці;
- мотив до отримання знань;
- наявність та доступність всього необхідного учбово-методичного та довідкового матеріалу;
- система регулярного контролю якості виконаної самостійної роботи;
- консультаційна допомога.

Контроль за самостійною роботою та оцінювання її результатів організується як єдність двох форм:

- самоконтроль та самооцінка студента;
- контроль та оцінка з боку викладача.

У методичних рекомендаціях «Іноземна мова. Завдання для самостійної роботи» пропонуються завдання для самостійного опрацювання студентам економічних спеціальностей та викладачам спеціальностей, пов'язаних з менеджментом, маркетингом, економікою тощо.

Під самостійним опрацюванням ми розуміємо таку форму організації навчально-пізнавальної діяльності студентів, яку спрямовує і контролює викладач або сам студент відповідно до програми навчання на аудиторних заняттях та у позааудиторний час з метою оволодіння знаннями, навичками й уміннями ділової англійської мови. Як наслідок, це впливає на розвиток

особистості, надає можливість диференційного підходу у навчанні та творчого підходу до організації самоосвіти студентів.

Самостійна робота на заняттях з іноземної мови розвиває у студентів такі важливі вміння, як пошук інформації, її аналіз та виділення головного, оцінювання інформативності матеріалу та професійно-орієнтоване спілкування на основі отриманої інформації. Отже, важливим є підвищити відповідальність студентів за хід та результати їхньої самостійної учбової діяльності щодо оволодіння іноземною (англійською) мовою.

Метою самостійної роботи студентів з іноземної мови є формування навичок роботи з іншомовними професійно-орієнтованими джерелами інформації (читання, переклад, творче переосмислення інформації, її особиста оцінка та подальше використання), а також формування навичок усного мовлення у рамках загальноосвітніх тем та професійної тематики.

Застосування самостійної роботи в учбовій діяльності дозволяє 1) оптимізувати процес навчання іноземній мові (англійській) з точки зору економії аудиторного учбового часу; 2) актуалізувати та активізувати пошук нових знань того, хто навчається; 3) підвищити якість засвоєння запропонованих учбових програм.

Підготовленість студентів до самостійної діяльності щодо вивчення запропонованого матеріалу визначається: 1) наявністю базових учбових навичок з усіх видів мовленнєвої діяльності, а саме: говорінню, аудіюванню, читанню, письму; 2) наявністю навичок перекладу та методами роботи зі словником та довідковою літературою; 3) вмінням працювати з комп'ютерним програмним забезпеченням та Інтернетом.

Методичні рекомендації складаються з 6 кредитів. Кожен кредит містить тексти за запропонованою темою та певний граматичний матеріал. До кожного тексту пропонується низка завдань на засвоєння професійної лексики та на розвиток навичок вживання граматичних явищ у розмовній мові. Студенти, працюючи над текстом, пртділяють увагу не тільки на його зміст, але й на ті чи

інші граматичні конструкції у ньому. На покращення знань з англійської мои також впливають разноманітні вправи, діалоги, ігрові завдання з ілюстраціями.

Самостійна робота сприяє виробленню звички систематично з максимальною продуктивністю працювати над мовою у відведені для занять години, продовжувати вивчення матеріалу позааудиторно. Зауважмо, що завдання для самостійного опрацювання можна починати виконувати під керівництвом викладача. На першому занятті викладач проводить інструктаж щодо виконання окремої частини: скільки годин відведено на дану тему (підтему), труднощі, специфіку роботи з даної темою тощо.

В ході роботи з підручником вирішуються наступні завдання:

1) відпрацьовуються навички читання загальнонаукової і термінологічної лексики;

2) опрацьовуються граматичні явища, характерні для наукового стилю викладу;

3) активізуються найбільш уживані загальнонаукові і термінологічні лексичні одиниці;

4) формуються навички диференційованого читання наукової літератури з метою вилучення інформації;

5) розвиваються навички перекладу текстів за фахом;

6) формуються навички реферування та анотування наукової статті;

7) формується готовність взяти участь в обговоренні професійних питань;

8) здійснюється знайомство з функціонально-стилістичною неоднорідністю наукової мови.

Типи вправ підібрані таким чином, щоб сприяти ефективному розвитку основних видів мовленнєвої діяльності, включаючи навички перекладу. Передбачаються наступні види роботи:

- сприйняття і відтворення слів, словосполучень;

- знаходження правильних лексичних та граматичних еквівалентів в двох мовах при перекладі;

- створення власних пропозицій або зв'язного тексту з використанням ключових слів і виразів;

- питально-відповідна форма роботи з текстом;

- складання плану або семантичної карти прочитаного тексту з подальшим його переказом;

- структурно-семантичний аналіз абзацу;

- смисловий аналіз тексту по абзацах;

- вправи на перифраз;

- навчання навичкам «стислих» переказів і письмовій компресії текстів та ін.

Тексти до підручника відібрані з автентичних сучасних наукових і науково-популярних видань і дають уявлення про жанровому різноманітті стилю наукового викладу. У підручник увійшли уривки з лекцій, монографій, підручників, статей і книг англомовних авторів.

UNIT 1

Mathematics and the history of its origin

I. Read and translate the following words. Make up 10 sentences with them.

Mechanics, mathematician, mathematical, farther, futher, theory, theoretical, measure, measurable, quality, equation, equivalence, particle, prediction, fiber-optic, imaging, analysis, system, rigorous, philosopher, phenomenon, discipline, ancient, creation, contemporary, enquiry, physicist, chemists, trajectory, particularly, particles, behavior, subatomic, multiple, simultaneously

II. **Active vocabulary**:

- number – сума, число, цифра, номер, екземпляр
- system – система, метод
- measure – вимірювати, міра
- quantity – величина, кількість
- equation – рівняння
- interaction – взаємодія
- terminology – термінологія
- analysis (*pl* analyses) - аналіз (аналізи)
- Arithmetic – арифметика
- Algebra – алгебра
- Geometry – геометрія
- calculus – вичислювання
- rigorous – точний
- equivalence – еквівалентність, рівносильність
- to summarize – підсумовувати, підводити підсумок
- gravity – тяжіння, сила тяжіння
- relativity – відносність
- applied – прикладний
- invention – винахід
- phenomenon (*pl* phenomena) – явище, феномен (явища)

- technology - технологія
- to calculate - вичисляти, підраховувати
- to compute - рахувати, підраховувати
- notion - поняття, ідея
- complex – складний, комплексний

III. Read and translate the text:

Mathematics

Mathematics is a way of describing relationships between numbers and other measurable quantities. Mathematics csn express simple equations as well as interactions among the smallest particles and the farthestobjects in the known Universe. Mathematics allows scientists to communicate ideas using universally accepted terminology. It is truly thr language of science.

We benefit from the results of mathematical research every day. The fiber-optic network carrying our telephone conversations was designed with the help of mathematics. Our computers are the result of millions of hours of mathematical analysis. Weather prediction,the design of fuel-efficient automobiles and airplanes, traffic control and medical imaging all depend upon mathematical analysis.

For the most part, mathematics remains behind the scenes. We use the end results without really thinking about the complexity underlying the technology in our lives. But the phenomenal advances in technology over the last 100 years parallel the rise of mathematics as an independent scientific discipline.

Until the 17th century, arithmetic, algebra and geometry were the only mathematical disciplines, and mathematics was virtually indistinguishable from science and philosophy. Developed by the ancient Greeks, these systems for investigating the world were preserved by Islamic scholars and passed on by Christian monks during the Middle Ages. Mathematics finally became a field in its own right with the development of calculus by English mathematician Isaak Newton and German philosopher and mathematician Gottfield Wilhelm Leibniz during the 17th century and the creation of rigorous mathematical analysis during

the 18th century by French mathematician Augustin Louis Cauchy and his contemporaries.Until the late 19th century, however, mathematics was used mainly by physicists, chemists, and engineers.

At the end of the 1800s, scientific researchers began probing the limits of observation, investigating the parts of the atom and the nature of light. Scientists discovered the electron in 1897. They had learned that light consisted of electron magnetic waves in the 1860s, but physicist Albert Einstein showed in 1905 that light could also behave as particles. These discoveries, along with inquiries into the wavelike nature of matter, led in turn to the rise of theoretical physics and to the creation of complex mathematical models that demonstrated physical laws. Einstein mathematically demonstrated the equivalence of mass and energy, summarized by the famous equation $E=mc^2$, in his special theory of relativity in 1905. Later, Einstein's general theory of relativity (1915) extended special relativity to accelerated systems and showed gravity to be an effect of acceleration. These mathematical models marked the creation of modern physics. Their success in predicting new physical phenomena, such as black holes and antimatter, led to an explosion of mathematical analysis. Areas in pure mathematics – that is, theory as opposed to applied, or practical, mathematics – became particularly active.

A similar explosion of activity began in applied mathematics after the invention of the electronic computer, the ENIAC (Electronic Numerical Integrator and Calculator), in 1946. Initially built to calculate the trajectory of artillery shells, ENIAC was later used for nuclear weapons research, weather prediction, and wind-tunnel design. Computers aided the development of efficient numerical methods for solving complex mathematical systems.

Without mathematics to describe physical phenomena, we might be living in a world with beautiful art, literature, and philosophy, but no technology. Even the medical advances of the last 50 years might not have occurred. Science and technology, in their turn, have provided many of the problems that motivated progress in mathematics. Such problems include the behavior of weather systems,

the motion of subatomic particles, and the creation of speedier and smaller computers that can perform multiple tasks simultaneously.

1. a) Give the Ukrainian for:

Numbers and other measurable quantities; equations as well as interactions; to communicate ideas; universally accepted terminology; to benefit from the results; to depend upon analysis; weather prediction; traffic control; to remain behind the scenes; complexity underlying the technology; phenomenal advances in technology; virtually indistinguishable; systems for investigating the world; the Middle Ages; to become a fieldin its own right; the creation of rigorous mathematical analysis; contemporary; light consists of electromagnetic waves; light can also behave as particles; to lead; in turn; theory of relativity; efficient numerical methods; to provide.

b) **Give the English for**:

Спосіб вираження відносин; оптоволоконна мережа; бути сконструйованим; в більшості випадків; незалежна наукова дисципліна; бути збереженим; давні греки; ісламістські вчені; християнські монахи; межа результатів наукових спостережень; хвильова природа матерії; створення складних математичних моделей; рівнозначність маси та енергії; позначили створення сучасної фізики; успіх в передбаченні; фізичні явища; чорні діри та антиматерія; подібний сплеск активності; дослідження ядерної зброї; розвиток ефективних числових методів; успіх медицини; служити причиною прогресу у математиці.

2. Match the words on the left with their translation on the right.

1. foundations	a) наука про
2. concise	b) вимірювання (дія)
3. the study of	c) прикладний
4. measuring	d) сукупність
5. to deal with	e) чистий
6. applied	f) основи

7. pure	g) безліч
8. contemporary	h) поняття
9. concept	i) теоретичний
10. mixture	j) розглядати
11. to transform	k) величина
12. to regard	l) кількість
13. to constitute	m) перетворювати
14. magnitude	n) сучасний
15. sets	o) вивчати
16. quantity	p) основи

3. Complete these networks with words and expressions from the text:

science

mathematics

physics

4. Complete the sentences:

1. Mathematics is a way of describing … .
2. Mathematics can express simple equations as well as … .
3. Mathematics allows scientists to communicate ideas … .
4. Areas in pure mathematics – that is, … .
5. Without mathematics to describe physical phenomena, … .

5. Find in the text and write out nouns denoting:

a) human professions; b) abstract nouns

6. Give the derivatives of the words completing the table below, translate them:

Noun	***Verb***	***Adjective***	***Adverb***
Mathematics	**---**		
	---	**phenomenal**	
	Compute		**---**
Science	**---**		
	Symbolize		

Equivalence			
			Relatively
Universe			
	Investigate		**---**
Nature	**---**		
		observable	**---**

7. Use the following combinations in the sentences and memorize them:

as well as

benefit from

with the help of

depend upon

for the most part

remain behind the scenes

pass on

in (smb's) turn

8. **Arrange the following in pairs of**

a) *synonyms*: numbers,area, creation, investigating, measurable, quantities, practical, communicate, advance, calculate, scholars, invention, applied, probing, scientific researchers, progress, field, pass on, compute.

b) *antonyms*: special, applied mathematics, initially, ancient, general, multiple, complex, modern, the only, simple, pure mathematics.

9. Read these pairs of nouns paying special attention on their translation:

Weather prediction, telephone conversation, traffic control, end result, artillery shell, nuclear weapons research, wind-tunnel design.

10. Answer the questions and develop the ideas:

1. What do you know about mathematics?
2. What do we benefit from the results of mathematical research every day?
3. What do you know about the history of mathematics?
4. When did mathematics become a field in its own right?

5. What do you know about scientific research in the end of the 18th and beginning of the 19th centuries?
6. Name several well-known mathematicians and say what they are famous for.
7. What role does the invention of a computer play inscience?
8. Science, technology and mathematics. What can you say about their interplay in modern life?

11. Give a short summary of the text.

12.**Choose one of the topics for a short talk to be given in class**:

1. The role of mathematics in the development of technology and in a history of the mankind.

2. Why I want to be a mathematician (My future profession).

IV. Read and translate the following words. Make up 10 sentences with them.

Mathematics, measurable, quantities, system, certainly, bases, wedge-shaped marks, religious, knowledge, well-preserved, merchandise, compute, compound, interest, calculate, tablets, require, arithmetic, geometry, calendar, mathematician, antiquity.

V. Acrive vocabulary:

- to keep track - простежувати
- herd – стадо
- early humans – давні люди
- evidence – очевидність, основа, служити доказом
- predominance – перевага, переважання, панування
- to involve - залучати
- commerce – комерція, торгівля
- cuneiform – клиноподібний знак
- to dominate – панувати, переважати
- to date from – вести літочислення від якоїсь дати

- to exchange money – обмінювати гроші
- to allocate – розміщувати, розподіляти
- share – частка, частина
- to reckon – рахувати, підраховувати, підводити підсумок
- henceforth – з цього часу, надалі
- enormous – величезний

VI. **Read and translate the text**:

The History of Mathematics

Mathematics is a science dealing with numbers and other measurable quantities.

Counting was the earliest mathematical activity. Early humans needed counts to keep track of herds and for trade. Primitive counting systems almost certainly used the fingers of one or both hands, as evidenced by the predominance of the numbers 5 and 10 as the bases for most number systems today.

The Babylonians of ancient Mesopotamia and the ancient Egyptians left the earliest records of organized mathematics. Arithmetic dominated their mathematics. Our knowledge of Babilonia comes from well-preserved clay tablets on which peole wrote with wedge-shaped marks known as cuneiform. The earliest tablets date from about 3000 BC.

Much of the mathematics on the tablets involved commerce. The Babilonians used arithmetic and simple algebra to exchange money and merchandise, compute simple and compound interest, calculate taxes, and allocate shares of a harvestto the state, temple, and farmer. The building of canals, granaries, and other public works also required using arithmetic and geometry. Calendar reckoning, used to determine the times for planting and for religious events, was another important application of mathematics.

Thales of Miletus and Pythagoras of Samos, the philosopher Democritus and the mathematician Hippocrates of Chios, Eudoxus of Cridus, Euclid – they come from ancient Greece. The great Alexandrian mathematicians – Eratosthenes, Archimedes,

Apollonius of P erga, Ptolemy, Diophantus and Hipparchus, Hindu mathematician and astronomer Aryabhata, Arab mathematician al-Khwarizmi, Persian mathematician Omar Khayyam were the most famous mathematicians of antiquity.

Russian mathematics was represented by Nikolay Lobachevsky. Credit for the creation of non-Eucliden geometry is given to him and Hungarian mathematician Janos Bolyai. Each man published an organized presentation of a geometry that allows an infinite number of parallel lines through a given point. Non-Euclidean geometry was the most impressive intellectual creation of the 19th century.

It showed that mathematics could no longer be regarded as a body of unquestionable truths and that the observable world could not provide all nthe answers. Mathematicians were henceforth liberated to explore whatever ideas attracted them, and they turned more and more toward abstraction and theory. Individual mathematicians felt free to define their notions and to set up their axioms as they pleased, subject only to the limitation that the axioms do not give rise to theorems that contradict one another. The enormous expansion in mathematical activity in the 20th century was largely the consequence of this new freedom.

1. **a) Give the Ukrainian for**:

Early humans; to keep track of herds and for trade; primitive counting systems; as evidenced by te predominance of the numbers 5 and 10; as the bases for most number systems today; further progress; were emphasized; with no trace of concepts such as axioms or proofs; our knowledge of Babylonia comes from / dates from; credit is given to him; impressive intellectual creation; to be regarded as; a body of unquestionable truths.

b) **Give the English for**:

Обмінювати гроші та торгувати; підраховувати прості та складні відсотки; підраховувати податки; розподіляти частки врожаю між державою, храмом та фермером; зерносховище; громадські роботи; вимагати, потребувати щось; обчислення за календарем; визначати час для посадки рослин і релігійних подій; розглядатися як звід незаперечних істин; були надалі вільні

досліджувати будь-які ідеї, які їх приваблювали; були більшою мірою наслідком.

2. **Consult a dictionary and write down the given words with their basic meanings and their derivatives, i.e. nouns, adjectives, adverbs, and set phrases, into your copybook.**

1. to count	5. to calculate	9. to reproduce
2. to compute	6. to determine	10. to define
3. to use	7. to regard	11. to advance
4. to require	8. to provide	12. to signify

3. Ask **and answer all possible questions**:

1. The Babylonians inherited the technical achievements of the Sumerians in irrigation and agriculture.
2. Maintaining the system of canals, dikes, weirs, and reservoirs constructed by their predecessors demanded considerable engineering knowledge and skill.
3. Preparation of maps, surveys, and plans involved the use of leveling instruments and measuring rods.
4. For mathematical and arithmetical purposes they used the Sumerian hexadecimal system of numbers, which featured a useful device of so-called place-value notation that resembles the present-day decimal system.
5. Measures of length, area, capacity, and weight, standardized earlier by the Sumerians, remained in use.

4. **Remove the parentheses and put the verb into the correct tense form**:

When I _____ (to begin) planning Robin's home school curriculum, it _____ (to made) sense to combine art and math, and to do hands-on projects for all subjects wherever possible.

Robin still _____ (to do) math problems in traditional workbooks. But we also _____ (to use) a book called *Family Math*, which _____ (to have) fun, big-picture math exercises that get off the page and into the real world.

There's a wonderful book called *Mathographics*, by Robert Dixon, that we _____ (to start) using yet, but that I think _____ (to fascinate) Robin. It _____ (to explore) the possibilities of mathematical drawing using a compass or computer graphics.

"In addition to the more usual activities of doing sums, solving equations, and proving theorems, mathematics can also be about doing drawings," the author _____ (to write) in the preface.

5. Answer the questions:

1. What is mathematics?

2. When did mathematical thought appear?

3. What were the earliest applications and records of organized mathematics?

4. Could you name the most famous ancient mathematicians?

5. Do you know any mathematicians of the 18th-19th centuries? What were they famous for?

6. What were the consequences of non-Euclidean geometry creation?

6. Give a short summary of the text.

7. Render in English:

Математика (з грецької *mathema* – знання, вчення, наука) – наука про кількісні відносини та просторові форми навколишнього нас світу. Розуміння самостійного положення математики як особливої науки виникло у Давній Греції у 5-6 роках до нашої ери. Математика об'єднує комплекс дисциплін: арифметика (теорія чисел), алгебра, геометрія, математичний аналіз (диференційне обчислення та інтегральне обчислення), теорія множин, теорія імовірностей та багато інших. Математика характеризується: а) високим ступенем абстрактносты ъъ понять (крапки – без розмірів, лінії – без товщини,

безліч будь-яких предметів та таке інше); б) високим ступенем їх спільності (наприклад, в алгебрі буква позначає будь-яке число, у математичній логіці розглядаються довільні висловлювання та т.і.). Абстрактність та спільність понять математики дозволяє один і той самий математичний апарат застосовувати у різних науках.

8. Choose one of the topics for a short talk to be given in class:

1. The history of mathematics.
2. Tell the class the biography of the most prominent (from your point of view) mathematician.

VII**. Read and translate the text**.

MY FUTURE PROFESSION

When a person leaves high school, he understands that the time to choose his future profession has come. It is not easy to make the right choice of future profession and job at once. Leaving school is the beginning of independent life and the start of a more serious examination of one's abilities and character. As a result, it is difficult for many school leavers to give a definite and right answer straight away.

This year, I have managed to cope with and successfully passed the entrance exam and now I am a "freshman" at Moscow Lomonosov University's Mathematics and Mechanics Department, world-famous for its high reputation and image.

I have always been interested in maths. In high school my favourite subject was Algebra. I was very fond of solving algebraic equations, but this was elementary school algebra. This is not the case with university algebra. To begin with, Algebra is a multifield subject. Modern abstract deals not only with equations and simple problems, but with algebraic structures such as "groups", "fields", "rings", etc; but also comprises new divisions of algebra, e.g., linear algebra, Lie group, Boolean algebra, homological algebra, vector algebra, matrix algebra and many more. Now I am a first term student and I am studying the fundamentals of calculus.

I haven't made up my mind yet which field of maths to specialize in. I'm going to make my final decision when I am in my fifth year busy with my research diploma project and after consulting with my scientific supervisor.

At present, I would like to be a maths teacher. To my mind, it is a very noble profession. It is very difficult to become a good maths teacher. Undoubtedly, you should know the subject you teach perfectly, you should be well-educated and broad minded. An ignorant teacher teaches ignorance, a fearful teacher teaches fear, a bored teacher teaches boredom. But a good teacher develops in his students the burning desire to master all branches of modern maths, its essence, influence, wide–range and beauty. All our department graduates are sure to get jobs they would like to have. I hope the same will hold true for me.

Comprehension check

1. **Are these sentences True (T) or False (F)? Correct the false sentences.**

a. The author has successfully passed an entrance exam to enter the Mathematics and Mechanics Department of Moscow Lomonosov University.

b. He liked all the subjects of maths when he was at high school.

c. Maths studied at university seems new for him.

d. This year he's going to choose a field of maths to specialize in.

e. He has a highly valued teaching career.

f. A good teacher of maths will bring to students a strong desire to study maths.

2. **Complete the sentences below.**

a. To enter a college or university and become a student you have to pass.....

b. Students are going to write their..... ...in the final year at university.

c. University students show their essays to their.....

3. **Work in groups**

a. Look at the words and phrases expressing personal qualities.

− sense of humour − good knowledge of maths

− sense of adventure − children – loving

− patience − intelligence

− reliability − good teaching method

− kindness − interest in maths

b. Discussion

What qualities do you need to become a good maths teacher?

c. Answer the following questions.

1. Why should everyone study maths? What about others people?
2. University maths departments have been training experts in maths and people take it for granted, don't they?
3. When do freshmen come across some difficulties in their studies?
4. How do mathematicians assess math studies?

VIII. Read and translate the text:

Counting in the Early Ages

Counting is the oldest of all processes. It goes back to the very dawn of human history. At all times and practically in all places, people had to think of supplies of food, clothing and shelter. There was often not enough food or other things. So, even the most primitive people were always forced to think of how many they were, how much food and clothing they possessed, and how long all those things would last. These questions could be answered only by counting and measuring.

How did people count in the dim and distant past, especially when they spoke different languages? Suppose you wanted to buy a chicken from some poor savage tribe. You might point toward some chickens and then hold up one finger. Or, instead of this, you might put one pebble or one stick on the ground. At the same time, you might make a sound in your throat, something like *ung*, and the savages would understand that you wanted to buy one chicken.

But suppose you wanted to buy two chickens or three bananas, what would you do? It would not be hard to make a sign for the number two. You could show two fingers or point to two shoes, to two pebbles, or to two sticks.

For *three* you could use three fingers or three pebbles, or three sticks. You see that even though you and the savages could not talk to one another, you could easily make the numbers *one, two*, and *three* known. It is a curious fact that much of the story of the world begins right here.

Have you ever tried to imagine what the world would be like if no one had ever learned how to count or how to write numerals? We are so in the habit of using numbers that we rarely think of how important they are to us.

For example, when we open our eyes in the morning, we are likely, first of all, to look at the clock, to see whether it is time to get up. But if people had never learned to count, there would be no clocks. We would know nothing of hours or minutes, or seconds. We could tell time only by the position of the sun or the moon in the sky; we could not know the exact time under the best conditions, and in stormy weather, we could only guess whether it was morning or noon, or night.

The clothes we wear, the houses we live in, and the food we eat, all would be different if people had not learned how to use numbers. We dress in the morning without stopping to think that the materials of which our clothing is made have been woven on machines adjusted to a fraction of an inch. The number and height and width of the stair steps on which we walk were carefully calculated before the house was built. In preparing breakfast, we measure so many cups of cereal to so many cups of water; we count the minutes it takes to boil the eggs, or make the coffee.

When we leave the house, we take money for bus fare unless we walk and for lunch unless we take it with us; but if people could not count, there would be no money. All day long, we either use numbers ourselves or use things that other people have made by using numbers.

It has taken people thousands of years to learn how to use numbers, or the written figures, which we call numerals. For a long time after men began to be civilized, such simple numbers as two and three were all they needed. For larger numbers, they used words in their various languages which correspond to expressions, such as lots of people, a heap of apples, a school of fish, and a flock of

sheep. For example, a study of thirty Australian languages showed no number above four, and in many of these languages there were number names for only one and two, the larger numbers being expressed simply as much and many.

You must have heard about the numerals, or number figures, called digits. The Latin word digiti means fingers. Because we have five fingers on each hand, people began, after many centuries, to count by fives. Later, they started counting by tens, using the fingers of both hands. Because we have ten toes as well as ten fingers, people counted fingers and toes together and used a number scale of twenty. In the English language, the sentence "The days of a man's life are three score years and ten" the word score means twenty (so, the life span of humans was considered to be seventy).

Number names were among the first words used when people began to speak. The numbers from one to ten sound alike in many languages. The name digits was first applied to the eight numerals from 2 to 9. Nowadays, however, the first ten numerals, beginning with 0, are usually called the digits.

It took people thousands of years to learn to write numbers, and it took them a long time to begin using signs for the numbers; for example, to use the numeral 2 instead of the word two.

When people began to trade and live in prosperous cities, they felt a need for large numbers. So, they made up a set of numerals by which they could express numbers of different values, up to hundreds of thousands.

People invented number symbols. To express the number one, they used a numeral like our 1. This numeral, probably, came from the lifted finger, which is the easiest way of showing that we mean one.

The numerals we use nowadays are known as Arabic. But they have never been used by the Arabs. They came to us through a book on arithmetic which was written in India about twelve hundred years ago and translated into Arabic soon afterward. By chance, this book was carried by merchants to Europe, and there it was translated from Arabic into Latin. This was hundreds of years before books were

first printed in Europe, and this arithmetic book was known only in manuscript form.

When people began to use large numbers, they invented special devices to make computation easier. The Romans used a counting table, or abacus, in which units, fives, tens and so on were represented by beads which could be moved in grooves. They called these beads calculi, which is the plural of calculus, or pebble. We see here the origin of our word calculate. In the Chinese abacus, the calculi slid along on rods. In Chinese, this kind of abacus is called a suan – pan; in Japanese it is known as the soroban and in the Russian language as the s'choty. The operations that could be rapidly done on the abacus were addition and subtraction. Division was rarely used in ancient times. On the abacus, it was often done by subtraction; that is, 7 to find how many times 37 is contained in 74, we see that 74 – 37 = 37, and 37 – 37 = 0, so that 37 is contained twice in 74.

Our present method, often called long division, began to be used in the 15th century. It first appeared in print in Calandri's arithmetic, published in Florence, Italy, in 1491, a year before Columbus discovered America.

The first machines that could perform all the operations with numbers appeared in modern times and were called calculators. The simplest types of calculators could give results in addition and subtraction only. Others could list numbers, add, subtract, multiply and divide. Many types of these calculators were operated by electricity, and some were so small that they could be easily carried about by the hand.

The twentieth century was marked by two great developments. One of these was the capture of atomic energy. The other is a computer. It may be rightly called the Second Industrial Revolution.

What is a computer? A computer is a machine that can take in, record, and store information, perform reasonable operations and put out answers. Such a machine must have a program, and specialists are needed to write programs and operate these machines.

1. **Transcribe the following words**:

   Clothes, civilized, woven, thousands, program, specialist, century, development

2. **Give the English for the four basic operations of arithmetic**:

   додавання, віднімання, множення, ділення.

3. **Supply the corresponding nouns for the following verbs. See the model**. Model: *to invent – invention*

   to add; to subtract; to multiply; to explain; to calculate; to operate; to compute; to translate; to inform; to expect.

4. **Give derivatives for the following words**.

   Model: *rare, rarely, rarity*

   to measure; to perform; to suppose; to use; difference; symbolic; computer; to imagine; to vary; to develop; to publish; to prosper; expressive; high; wide; to prepare.

5. **Match the following**.

1. distant past	a) визначити час
2. to tell time	b) далеке минуле
3. to perform operations	c) точний час
4. exact time	d) виконувати операції
5. rarely	e) винаходити
6. to invent	f) рідко
7. digit	g) зберігати інформацію
8. to store information	h) однозначне число
9. to record	i) пристосування
10. device	j) записувати
11. ancient times	k) процвітати
12. to prosper	l) давні часи
13. abacus	m) лічильна дошка
14. to print	n) рахівниці
15. counting table	o) печатати

6. Supply antonyms for the following words.

Subtract, before, hard, unknown, begin, unlikely, unimportant, alike,

intentionally, small, ancient times, first, long, simple, easy, past, rapidly, often.

7. Find synonyms in the text.

to make calculation easier

to do operations

to show one finger

the etymology of the word *calculate*

to be quickly done

to be seldom used

no number larger than *four*

to be marked by two great achievements

first printed in Italy.

8. Fill in each blank with an appropriate preposition: ***of, to, in, at, through, with, on.*** **One preposition can be used several times.**

… our modern world, mathematics is related … a very large number … important human activities. Make a trip … any modern city, look …the big houses, plants, laboratories, museums, libraries, hospitals and shops, … the system … transportation and communication. You can see that there is practically nothing … our modern life which is not based … mathematical calculations. … co-operation … science, mathematics made possible our big buildings, railroads, automobiles, airplanes, spaceships, subways and bridges, artificial human organs, surgical operations and means of communication that in the past seemed fantastic and could never be dreamt … .

9. Answer the following questions:

1. What is the text about?
2. What signs did people use instead of numerals?
3. What is the role of numerals in our life?
4. What numbers sound alike in many languages?

5. What number names is the word digit applied to?
6. How long has it taken people to learn to use numbers?
7. What is a numeral?
8. How did the first arithmetic book appear in Europe?
9. What numbers were the most important for people in the remote past?
10. What devices did they invent to make computation easier?
11. What operations were done on the abacus?
12. When did long division appear?
13. What were the first counting machines called?
14. Could they perform all basic operations of arithmetic?
15. What development was the next step in counting?

IX. Read and translate the text:

Four Basic Operations of Arithmetic

There are four basic operations of arithmetic. They are: addition, subtraction, multiplication and division. In arithmetic, an operation is a way of thinking of two numbers and getting one number. An equation like 3 + 5 = 8 represents an operation of addition. Here you add 3 and 5 and get 8 as a result. 3 and 5 are addends (or summands) and 8 is the sum. There is also a plus (+) sign and a sign of equality (=). They are mathematical symbols.

An equation like 7 – 2 = 5 represents an operation of subtraction. Here 7 is the minuend and 2 is the subtrahend. As a result of the operation, you get the difference. There is also the mathematical symbol of the minus (-) sign. We may say that subtraction is the inverse operation of addition since 5 + 2 = 7 and 7 – 2 = 5.

The same may be said about division and multiplication, which are also inverse operations.

In multiplication, there is a number that must be multiplied. It is the multiplicand. There is also a multiplier. It is the number by which we multiply. If we multiply the multiplicand by the multiplier, we get the product as a result. In the

equation 5 × 2 = 10 (five multiplied by two is ten) five is the multiplicand, two is the multiplier, ten is the product; (×) is the multiplication sign.

In the operation of division, there is a number that is divided and it is called the dividend and the number by which we divide that is called the divisor. When we are dividing the dividend by the divisor, we get the quotient. In the equation 6 : 2 = 3, six is the dividend , two is the divisor and three is the quotient; (:) is the division sign.

But suppose you are dividing 10 by 3. In this case, the divisor will not be contained a whole number of times in the dividend. You will get a part of the dividend left over. This part is called the remainder. In our case, the remainder will be 1. Since multiplication and division are inverse operations, you may check division by using multiplication.

1. **Read the following words according to the transcription**.

addition [q´diSqn] – додавання

subtraction [sqb´trxkSqn] – віднімання

multiplication [ˌmAltipli´keiSqn] – множення

division [di´viZqn] – ділення

addend [q´dend] – доданок

summand [´sA mqnd] – доданок суми (будь-який член суми)

minuend [´minjuend] – зменшуване

subtrahend [´sAbtrqhend] – від'ємник

inverse [in´vWs] – зворотний

multiplier [´mAltiplQiq] – множник

multiplicand [ˌmAltipli´kxnd] – множене

dividend [´dividqnd] – ділене

divisor [di´vQizq] – дільник

equation [I´kweiSqn] – рівняння

quotient [´kwquSqnt] – частка

2. Answer the following questions.

1. What are the four basic operations of arithmetic?

2. What mathematical symbols are used in these operations?

3. What are inverse operations?

4. What is the remainder?

5. How can division be checked?

3. **Give examples of equations representing the four basic operations of arithmetic and name their constituents**.

4. **Match the terms in Table A with their Ukrainian equivalents in Table B.**

Table A	Table B
1. addend	a) зменшуване
2. subtrahend	b) доданок
3. minuend	c) частка
4. multiplier	d) рівняння
5. multiplicand	e) ділене
6. quotient	f) множене
7. divisor	g) залишок
8. dividend	h) зворотна дія
9. remainder	i) дільник
10. inverse operation	j) від'ємник
11.equation	k) різниця
12.product	l) добуток
13. difference	m) множник

5. **Read the following equations aloud. Give examples of your own.**

Model:

9 + 3 = 12 (nine plus three is twelve)

10 – 4 = 6 (ten minus four is six)

15 × 4 = 60 (fifteen multiplied by four is sixty)

50 : 2 = 25 (fifty divided by two is twenty five)

1. 16 + 22 = 38

2. 280 – 20 = 260

3. 1345 + 15 = 1360 15

4. 2017 – 1941 = 76

5. 70 × 3 = 210

6. 48 : 8 = 6

7. 3419 × 2 = 6838

8. 4200 : 2 = 2100

6. The italicized words are all in the wrong sentences. Correct the mistakes.

1. *Multiplication* is an operation inverse of subtraction.
2. The product is the result given by the operation of *addition*.
3. The part of the dividend which is left over is called the *divisor*.
4. *Division* is an operation inverse of addition.
5. The difference is the result of the operation of *multiplication*.
6. The quotient is the result of the operation of *subtraction*.
7. The sum is the result of the operation of *division*.
8. **Addition** is an operation inverse of multiplication.

7. **Turn from Active into Passive**.

Model:

1. Scientists introduce new concepts by rigorous definitions.

   New concepts are introduced by rigorous definitions.

2. Mathematicians cannot define some notions in a precise and explicit way.

   Some notions cannot be defined in a precise and explicit way.

1. People often use this common phrase in such cases.
2. Even laymen must know the foundations, the scope and the role of mathematics.
3. In each country, people translate mathematical symbols into peculiar spoken words.
4. All specialists apply basic symbols of mathematics.
5. You can easily verify the solution of this equation.
6. Mathematicians apply abstract laws to study the external world of reality.

7. A mathematical formula can represent interconnections and interrelations of physical objects.
8. Scientists can avoid ambiguity by means of symbolism and mathematical definitions.
9. Mathematics offers an abundance of unsolved problems.
10. Proving theorems and solving problems form a very important part of studying mathematics.
11. At the seminar, they discussed the recently published article.
12. They used a mechanical calculator in their work.
13. One can easily see the difference between these machines.
14. They are checking the information.
15. The researchers have applied new methods of research.
16. They will have carried out the experiment by the end of the week.

UNIT 2

Mathematical concepts

Text 1

Read the text and send its contents in the Ukrainian language:

Fractions

There are 360 degrees in a revolution. If we divide a revolution into two equal parts, each part will contain 180 degrees. As we know, 180 degrees is regarded as one-half or of a revolution. Then if we divide a revolution into four equal parts, each part will have 90 degrees, which is called one-quarter or of a revolution. We can continue this process dividing a revolution into five equal parts, and each part will contain 72 degrees, which is a fifth or of a revolution. These parts, such as are called fractions. The top figure of the fraction is called the numerator and the bottom one – the denominator.

A fraction in which the numerator and the denominator are the same, is equal to 1 (2/2; 5/5). A proper fraction is a fraction whose numerator is less than its denominator, i.e. a fraction less than 1 (2/3; 5/8). An improper fraction is a fraction whose numerator is greater than its denominator, i.e. a fraction greater than 1 (6/4; 9/2). We say that this fraction has a whole number and a proper fraction. A fraction of this kind is called a mixed number (1 ½; 5 3/4). Fractions which represent the same fractional number like ½, ¾, 3/6, 4/8 and so on, are called equivalent fractions.

We have already seen that if we multiply a whole number by 1 we leave the number unchanged. The same is true of fractions when we multiply both integers in a fraction by the same number. For example, 1x ½=1/2 . We can also use the idea that 1 can be expressed as a fraction in various ways 2/2, 3/3, 4/4 and so on.

Now see what happens when you multiply 1/2 by 2/2 . You will have

½ = 1x ½= 2/2 x ½ = 2 x 1 / 2 x 2 = 2/4

As a matter of fact in the above operation you have changed the fraction to its higher terms.

Now look at this: 6/8 :1 = 6/8 : 2/2 = 3/4. In both of the above operations the number you have chosen for 1 is 2/2 .

In the second example you have used division to change 6/8 to lower terms, that is to 3/4. The numerator and denominator in this fraction are prime and accordingly we call such a fraction the simplest fraction for the given rational number.

1. **Read and translate the following words. Make up sentences with them.**

   A degree, a revolution, to divide, equal parts, to contain, a fraction, a numerator, a denominator, a proper fraction, an improper fraction, a mixed number

2. **Match the words on the left with their definition on the right**.

1. a degree *2. a revolution* *3. to divide* *4. equal parts* *5. to contain* *6. a fraction* *7. a numerator* *8. a denominator* *9. a proper fraction* *10. a mixed number*	a) the bottom number in a fraction that shows the number of equal parts an item is divided into b) a number consisting of a whole number and a proper fraction c) a unit for measuring the size of an angel d) to separate into parts or groups e) it represents a part of a whole, any number of equal parts f) to have something inside or include something as a part g) exactly the same in number, amount, degree, rank or quality h) a movement in a circle or curve around a central point i) a fraction in which the numerator is less or lower than the denominator j) the top number in a fraction

3. **Fill in the new vocabulary into the sentences:**
    1. The bag … a razor, some soap, and a towel.
    2. You can make green by … blue and yellow paint.
    3. Some paints … lead, which can be poisonous.
    4. Shake the bottle well to … the oil with the vinegar.
    5. They produce trashy TV programs that appeal to the lowest common … .
4. **Translate the sentences from Ukrainian into English:**
    1. Місяць робить один оберт навколо Землі приблизно за 29,5 днів.
    2. Я певною мірою з Вами погоджуюсь.
    3. Його план – отримати диплом економіста, а потім рік працювати за кордоном.
    4. Період обертання Землі навколо Сонця дорівнює одному року.
    5. Земля робить один оберт навколо своєї осі приблизно за 24 години.
    6. Вона витрачає лише частку свого заробітку.
    7. Підроблені дизайнерські годинники продаються за незачну ціну від справжніх годинників.
    8. Чисельник у дробі 3/5 дорівнює 3.
    9. Я думаю, о єдиним спільним знаменником успіху є наполеглива праця.
    10. Спільним знаменником у циз двох виборчих компаніях були гроші.
5. Answer the following questions:
    1. What have you seen if you multiply a whole number by 1?
    2. Have you changed the fraction when you multiply 1/2 by 2/2?
    3. What division have you used to change 6/8 to lower terms?

Text 2

Read and translate the text into the Ukrainian language:

Why formulas are important

There are at present millions of different homes all over the world, naturally, the problem of housing concerns every person.

Perhaps you have never thought of the amount of planning that even a small house requires before its construction begins. Many questions have to be solved before the architect designs such a house-questions of dimensions, of materials and of probable costs. After the blueprints have been completed, a lot of computing and figuring must be done. The same problems arise in manufacturing automobiles, airplanes and machinery. The computational work which is necessary in solving these problems is simplified by using formulas. They have been discovered and developed by the combined effort of mathematicians, scientists and engineers. That is why the formula has been called a key to knowledge. It contains the results of investigations that may have extended over many years. A mathematical formula arises when a mathematical rule or relation is written in the shorthand of algebra. Therefore it is very important to be able to discover the rule or relation which underlies such a formula. We can also obtain formulas from tables. There are many situations in which it is necessary to have tables showing related sets of numbers.

For instance there is a table used in a gasoline station for the purpose of determining the cost of the number of gallons bought by a motorist. If you look at this table, you will see that there is a uniform relation between the number or gallons bought and the price. This relation can be expressed by the making a formula.

It is the same with a scientist or an engineer who has been experimenting for some time to obtain new information. He usually records his results in the form of a table. Then he expresses by means of a formula the relationship given in his table. In this way formulas can be obtained from tables.

1. **Read and translate the following words. Make up sentences with them.**

   To contain, to concern, amount, to require, to solve a problem, an architect, dimention, to complete, blueprints, to simplify, a combines effort, a scientist, a key to knowledge, an investigation, extend, shorthand, purpose, to determine, cost, to express, to obtain, relationship

2. **Name in one word**:
   1. to make something easier to use or understand;
   2. the thing that you want to achieve, when you do something or make a plan;
   3. the amount of money you must pay for services, activities, or things you need all the time like food and electricity;
   4. the way that two people or groups feel about each other and behave towards each other;
   5. a quantity of something;
   6. a measurement such as length, width, or height;
   7. **to finish doing something;**
   8. a professional who conducts and gathers research to further knowledge in a particular area;
   9. **the act or process of examining a crime, problem, statement, etc. carefully, especially to discover the truth;**
   10. **to get something, especially by asking for it, buying it, working for it, or producing it from something else.**

3. **Give the synonyms to the following words:**
   - to be relevant to –
   - quantity, mass –
   - to stand in need of, demand, order –
   - to finish, to end –
   - to make easy –
   - attempt, try –
   - include, comprise –

- research, exploration –
- increase, expand, stretch –
- aim, goal –
- to get –
- to put into words -

4. **Fill in the new vocabulary into the sentences:**

1. They had known each other for years and had a very close … .
2. The … of tax you pay depends on how much you earn.
3. The government is planning to … the tax laws.
4. Try to reduce the … of fat in your diet.
5. The main … of the meeting is to discuss who will be in the team.
6. Many old people cannot afford the … of heating their homes.
7. His … with his parents has never been very good.
8. My … in writing this book was to draw attention to the problem of global warming.
9. A computer can store a vast … of information.
10. Length is one …, and breadth is another.

5. **Answer the questions**:

1. What is called a key to knowledge and why?
2. When does a mathematical formula arise?
3. In what way can formulas be obtained?

6. **Underline the correct tense**.

1. If you *write / have written* first ½ = 3/6 and then ½ = n/6 that means you *replace / have replaced* 3 with n.

2. My research adviser *find / has found* the second chapter of my dissertation too long.

3. You *do not divide / have not divided* the given quantity into two parts.

4. The professors *agree / have agreed* to accept these principles as the basis of their work.

5. Some first year students *perform / have performed* this relativity simple operation.

♦ **Note**

The Present Perfect is also used to express complete actions over a period of time.

7. Put the verbs in the brackets into the Present Perfect tense and read through this extract from an advertisement about the Emerging Markets Fund.

Over the past five years, the capital returns from many emerging Asian and Latin American stock markets …… (be) substantially higher than those of the developed world.

For example the market in Argentina ……(rise) by 793% and Mexico (increase) by 645%. In Asia, the booming market in Thailand ……..... (go up) by 364%,and investors in the Philippines …… (see) a return of 204%. The major developed nations …… (not / manage) to make anything like such significant returns. The market in the USA …… (grow) by 69.8% and in Japan, the market (fall) …… by 32.2% over the same period. The growth rates that these emerging markets …….. (enjoy) in recent years is little short of phenomenal. And we are firmly convinced, much more is yet to come. Our new Emerging Markets Fund, therefore, offers you an easy and attractive way of investing now in the world of tomorrow and its many exceptional growth opportunities.

- **Practice saying these expressions**.

Fractions 1/2, ¼, 1/3, 2/3, ¾, 1/8, 3/16

Equations

$$a)\ x=\frac{a+b}{c} \qquad d)\ V=IR$$

$$b)\ x+y=\frac{\Delta}{a-b} \qquad e)\ \frac{1}{u}+\frac{1}{v}=\frac{1}{f}$$

$$c)\ I=a+(n-1)d \qquad f)\ v=u+at$$

Text 3

1. **Pre – reading task. Discuss in groups the following problem**.

   What is the difference (distinction) between two math terms: "natural numbers" and "cardinal numbers". Is the number 5 natural or cardinal?

2. **Read the text to get more information about J.E.Freund's System of Natural Numbers Postulates.**

J.E.FREUND'S SYSTEM OF NATURAL NUMBERS POSTULATES

Modern mathematicians are accustomed to derive properties of natural numbers from a set of axioms or postulates (i.e., undefined and unproven statements that disclose the meaning of the abstract concepts).

The well known system of 5 axioms of the Italian mathematician, Peano provides the description of natural numbers. These axioms are:

First: 1 is a natural number.

Second: Any number which is a successor (follower) of a natural number is itself a natural number.

Third: No two natural numbers have the same follower.

Fourth: The natural number 1 is not the follower of any other natural number.

Fifth: If a series of natural numbers includes both the number 1 and the follower of every natural number, then the series contains all natural numbers.

The fifth axiom is the principle (law) of math induction.

From the axioms it follows that there must be infinitely many natural numbers since the series cannot stop. It cannot circle back to its starting point either because 1 is not the immediate follower of any natural number. In essence, Peano's theory states that the series of natural numbers is well ordered and presents a general problem of quantification. It places the natural numbers in an ordinal relation and the commonest example of ordination is the counting of things. The domain of applications of Peano's theory is much wider than the series of natural numbers alone e.g., the relational fractions 1, ½, 1/3, ¼ and so on, satisfy the axioms similarly. From Peano's five rules 24 we can state and enumerate all the familiar

characteristics and properties of natural numbers. Other mathematicians define these properties in terms of 8 or even 12 axioms (J.E.Freund) and these systems characterize properties of natural numbers much more comprehensively and they specify the notion of operations both arithmetical and logical.

Note that sums and products of natural numbers are written as a + b and a . b or ab, respectively.

Postulate No.1: For every pair of natural numbers, a and b, in that order, there is a unique (one and only one) natural number called the sum of a and b.

Postulate No.2: If a and b are natural numbers, then a + b = b + a

Postulate No.3: If a, b and c are natural numbers, then

$$(a + b) + c = a + (b + c)$$

Postulate No.4: For every pair of natural numbers, a and b, in that order, there is a unique (one and only one) natural number called the product.

Postulate No.5: If a and b are natural numbers, then ab = ba

Postulate No.6: If a, b and c are natural numbers, then (ab)c = a(bc)

Postulate No.7: If a, b and c are natural numbers, then a(b + c) = ab + ac

Postulate No.8: There is a natural number called "one" and written 1 so that if a is an arbitrary natural number, then a.1 = a

Postulate No.9: If a, b and c are natural numbers and if ac = bc then a = b

Postulate No.10: If a, b and c are natural numbers and if a + c = b + c then a = b

Postulate No.11: Any set of natural numbers which (1) includes the number 1 and which (2) includes a + 1 whenever it includes the natural number a, includes every natural number.

Postulate No.12: For any pair of natural numbers, a and b, one and only one of the following alternatives must hold: either a = b, or there is a natural number x such that a + x = b, or there is a natural number y such that b + y = a .

Freund's system of 12 postulates provides the possibility to characterize natural numbers when we explain how they behave and what math rules they must obey. To conclude the definition of "natural numbers" we can say that they must

be interpreted either as standing for the whole number or else for math objects which share all their math properties. Using these postulates mathematicians are able to prove all other rules about natural numbers with which people have long been familiar.

1. **Read and translate the following words. Make up sentences with them.**

   Cardinal numerals, to be accustomed, to derive, properties, undefined, unproven, a statement, to disclose, to provide, a successor, ordinal nimerals, to count, application, to satisfy, to enumerate, familiar, to define, definition, comprehensively, to obey, a rule, to share, to prove.

2. **Match the words on the left with their definition on the right**.

1. a cardinal numeral 2. to be accustomed 3. to derive 4. a property 5. to provide 6. a successor 7. application 8. to satisfy 9. familiar 10. to obey	a) an object or objects that belong to someone; b) a way in which something can be used for a particular purpose c) is a part of speech used to count; d) easy to recognize because of being seen, met, heard, etc. before; e) to please someone by giving them what they want or need; f) adapted to existing conditions; g) to give someone something that they need; h) to take, receive, or obtain especially from a specified source; i) to act according to what you have been asked or ordered to do by someone in authority, or to behave according to a rule, law, or instruction; j) someone or something that comes after another person or thing;

3. **Fill in the new vocabulary into the sentences:**

1. All meals are … at no additional cost.

2. The house looked strangely …, though she knew she'd never been there before.

3. The university is seeking … **to** its vice chancellor, who retires this spring.

4. The river ... its name *from* a Native American tribe.

5. The club does not accept responsibility for loss of or damage to club members' personal … .

6. Come on, satisfy my **…** - what happened last night?

7. This booklet … useful information about local services.

8. The design has many … .

9. They have 31 flavours of ice cream - enough to … everyone!

10. There were one or two … faces.

11. The soldiers refused to … .

4. **Answer the questions**.

1. How many axioms did the Italian mathematician Peano give? What were they?

2. Which axiom is the most important? Why?

3. What does Peano's theory state in essence?

4. What can we state from Peano's five rules?

5. Who developed these axioms? What did he do?

6. How useful is Freund's system of 12 postulates?

5. **Complete the formulae written by Freund's system of 12 postulates**.

If a, b, c are natural numbers:

$a + b =$..... $a (b + c) =$.....

$(a + b) + c =$..... $a.1 =$.....

$ab =$..... $ac = bc \Rightarrow$ .....

$(ab)c =$..... $a + c = b + c \Rightarrow$ .....

TEXT 4

1. Read and translate the following text.

SOMETHING ABOUT MATHEMATICAL SENTENCES

A mathematical sentence containing an equal sign is an equation. The two parts of an equation are called its members. A mathematical sentence that is either true or false but not both is called a closed sentence. To decide whether a closed sentence containing an equal sign is true or false, we check to see that both elements, or members of the sentence name the same number. To decide whether a closed sentence containing an ≠ sign is true or false, we check to see that both elements do not name the same number.

The relation of equality between two numbers satisfies the following basic axioms for the numbers a, b and c.

Reflexive: a = a.

Symmetric: If a = b then b = a.

Transitive: If a = b and b = c then a = c.

While the symbol = in an arithmetic sentence means is equal to, another symbol ≠ , means is not equal to. When an = sign is replaced by ≠ sign, the opposite meaning is implied. (Thus 8 = 11 – 3 is read eight is equal to eleven minus three while 9 + 6 ≠ 13 is read nine plus six is not equal to thirteen.)

The important feature about a sentence involving numerals is that it is either true or false, but not both. There is nothing incorrect about writing a false sentence, in fact in some mathematical proofs it is essential that you write a false sentence.

We already know that if we draw one short line across the symbol = we change it to ≠. The symbol ≠ implies either of two things – is greater than or is less than. In other words the sign ≠ in 3 + 4 ≠ 6 tells us only that numerals 3 + 4 and 6 name different numbers, but does not tell us which numeral names the greater or the lesser of the two numbers.

To know which of the two numbers is greater let us use the conventional symbol < and > . < means is less than while > means is greater than. These are

inequality symbols because they indicate order of numbers. (6 < 7 is read six is less than seven, 29 > 3 is read twenty nine is greater than three). The signs which express equality or inequality (= , ≠ , < , >) are called relation symbols because they indicate how two expressions are related.

1. **Read and translate the following words. Make up sentences with them.**
   An equation, to decide, an equal sign, reflexive, transitive, arithmetic sentence, to mean, to imply, feature, to involve, essential, to draw a line
2. **Name in one word**:
   - to make a choice that you are going to do something;
   - a picture or a shape which has a particular meaning, and which is well known and often used;
   - to make a picture, pattern, line etc. using a pen or pencil;
   - a mathematical statement consisting of an equal symbol between two algebraic expressions that have the same value;
   - showing that the action of the verb is directed back on the subject;
   - having or needing an object;
   - to communicate an idea or feeling without saying it directly;
   - a typical quality or an important part of something;
   - relating to something's or someone's basic or most important qualities.
3. **Give the synonyms to the following words:**
   1. a symbol, a mark, a code –
   2. characteristic, trait –
   3. to make a picture –
   4. equivalence, balance –
   5. to stand for –
   6. to include, to comprise, to contain –
   7. to make up one’s mind, to come to a conclusion –
   8. important, neede, vital, crucial –

4. **Translate the sentences from Ukrainian into English:**
   1. Того вечора вона вирішила розповісти про все матері.
   2. Якщо ви вирішите не приймати нашу пропозицію, повідомте мене.
   3. Я вирішив, що маю кинути палити.
   4. Ви не бачили знаків обмеження швидкості?
   5. На вивисці було написано: «Куріння заборонено!»
   6. Що означає це слво?
   7. Там написано: «не підходить до дітей», що означає дітей до 16 років.
   8. Він сказав, що Сара була дуже близькою подругою, але я не був впевнений, що він мав на увазі.
   9. Що ти малюєш?
   10. Хтось накреслив лінію під моїм ім'ям.
   11. Рішення може бути виражене математичним рівнянням.
   12. Одна сторона рівняння повинна збалансовувати іншу.
   13. Я не хотів їх відповілати, це сталося рефлексивно.
   14. Я ніколи не хотів натякати на ті події.
   15. Сіобода не обов'язково передбачає відповідальність.
   16. Його план поєднує в собі найкращі риси попередніх пропозицій.
5. **Express the symbol = , ≠ , > , < in arithmetical sentences**.

   Example: x > y : – Is x equal to y?

   – No, x is greater than y.

   a) $a = b^2$

   b) $\alpha \neq \beta$

   c) $3b + 2c > 1$

   d) $x^2 - x < 0$
6. **How are the symbols =, ≠, <, > read?**

7. Read out these expressions.

$x \equiv y$	y 5
$x \neq y$	$x \leq 10$
$x \approx 10$	$y \geq 10$
$x \to 0$	$x \alpha y$
$x < 5$	$x \to \infty$
$x > 5$	$x = \pm 2$
y 5	$x = 0$

8. Write the words in brackets in the correct form of the degrees of comparison.

1. I love being in London. The life is a lot … (exciting) in Gdansk.
2. This problem is … (simple) one I've ever solved.
3. My new school is … (far) away from my house than my old one.
4. Mike got the job because he is … (experienced) the other candidates.
5. The students sitting in a distance can't hear you. I'm afraid you'll have to speak … (loud).
6. Ann has got three sisters and four brothers, but she is … (young).
7. Helen has … (soft) voiceI have ever heard.
8. This is … (realistic) detective story I've ever read.
9. That is … (silly) dead you've ever done.
10. This year, festivals are … (colourful) they were last year.

9. Use the words in capitals to form a word that fits in the space.

Recently, many people have shown an interest in (1) … (RELAX) techniques whose (2) … (POPULAR) has increased. There is a range of (3) … (EXCITE) options to choose from. For example, listening to calming music in (4) … (COMFORT) surroundings is beneficial. People are also becoming interested in the (5) … (MYSTERY) secrets of meditation, which is (6) … (EXACT) what many people need to forget most of their daily worries.

10**. Choose the correct answer**.

1. When the robbery happened, the security guard … !

a) slept b) was sleeping c) had slept d) was slept

2. I … my dentist tonight.

a) am seeing b) see c) saw d) have seen

3. My brother and I … swimming almost every day last summer.

a) went b) had been going c) were going d) had gone

4. Actually, I… a cup of tea first thing every morning but then I switch to coffee.

a) do drink b) am drinking c) have drunk d) have been drinking

5. “Whose is this plane ticket on the floor?” – “Oh, it … to me. Thank you.”

a) is belonging b) belongs c) has belonged d) belonged

6. You need a passport to cross the … between Mexico and the USA.

a) edge b) line c) border d) rim

7. Ann doesn’t work … time. She works only 5 hours a day.

a) part b) full c) whole d) some

8. If someone is seriously ill, they may need to go to hospital to have a/an … .

a) operation b) plaster c) filling d) drug

9. … the onions in cooking oil until they are golden brown.

a) Boil b) Bake c) Fry d) Grill

10. Sheis a very … person – always smiling and in a good mood.

a) please b) cheerful c) delighted d) glad

UNIT 3

Electronic computer is the basis of modern informatics

1. **Read and translate the passage below**.

There is much thinking and reasoning in maths. Students master the subject matter not only by reading and learning, but also by proving theorems and solving problems. The problems therefore are an important part of teaching, because they make students discuss and reason and polish up on their own knowledge. To understand how experimental knowledge is matched with theory and new results extracted, the students need to do their own reasoning and thinking.

Some problems raise general questions which discussion of, can do much to advance your understanding of particular points of the theory. Such general questions ask for opinions as well as reasoning; they obviously do not have a single, unique or completely right answer. More than that, the answers available are sometimes misleading, demanding more reasoning and further proving. Yet, thinking your way through them and making your own choices of opinion and then discussing other choices is part of a good education in science and method of teaching.

2. **Read and translate the following words. Make up sentences with them.**

To reason, to master, to prove theoremes, to solve problems, to discuss, to polish up one's knowledge, to understans, to match, to extract, to raise questions, to advance, an opinion, unique, available, to mislead, to demand, education, a choice

3. **Match the words on the left with their definition on the right**.

1. to reason 2. to prove 3. to understand 4. an opinion 5. available 6. education	a) it means that this subject you can get, buy, or use; b) to know the meaning of what someone says, or to know why something happens or how something happens; c) all the different things or people that you can choose from;

7. a choice 8. to master 9. to discuss 10. to mislead	d) to tell someone why something happened; e) to lead in a wrong direction or into a mistaken action or belief often by deliberate deceit; f) what you think about a subject or situation; g) to talk about a subject with someone and tell each other your ideas or opinions; h) to show that something is definitely true, by providing facts or information; i) to learn how to do something well; j) the whole process by which people learn and develop their minds in schools, colleges, and universities.

4. Fill in the new vocabulary into the sentences.

1. Can you … that you were at home at that time?
2. She spoke slowly and clearly so that everone could … .
3. Do you want my … ? I don't think the colour really suits you.
4. The government should spend more on … .
5. You will have a … of twelve questions in the exam.
6. She lived in Italy for several years but never quite … the language.
7. Do you have any accommodation …?
8. He wanted to … that he was just as clever as his sister.
9. I'm telling the truth, and I can … it to you.
10. Scientists are beginning to … how the universe was formed.
11. In my …, most lawyers are overpaid.
12. There is no room for more books – we have used up all the … space.
13. Only a minority of parents can afford private … for their children.
14. The school seems OK, but there is not a great … of courses.
15. He quickly … the art of interviewing people.

5. **Underline all – ing forms in the text**.

6. **Compare these sentences.**

a. Students need to do their own reasoning and thinking.

b. Thinking your way through them and making your own choices of opinion and then discussing other choices is part of a good education in science.

c. The answers available are sometimes misleading, demanding more reasoning and further proving.

- In which sentence is the – ing form used as a subject?
- In which sentence is the – ing form used as an object?
- In which sentence does the – ing form modify a noun?

5. **Complete the sentences with the – ing form of an appropriate verb from the list**.

perform – find – link – know – keep up – receive – multiply – send

a. …… with the latest news of your favourite team is easy on the Web.

b. They have circuits for …… arithmetic operations.

c. One of the most useful features of the Internet is …..... and …...email.

d. The product may be found by …… the factors contained in the given mathematical sentence.

e. Search engines are a way of …… information on the Web.

f. …… the properties of equality will help you decide whether a sentence is true or false.

6. **Work in pairs to make a conversation following the example**.

Example: draw pictures on a computer? (use graphic package)

→ – How do you draw pictures on a computer?

– By using a graphic package.

a. find a website? (use a search engine)

b. select an option on a menu? (click the mouse)

c. increase the speed of your computer? (add memory)

d. end a search on the web? (select the stop button)

e. form a ray? (extend a line segment in only one direction)

f. locate the point in the plane? (apply your knowledge of geometry)

7. **Continue the conversation and practise in pairs**.

Example: A: It is important to know these rules.

B: Yes, knowing these rules is important.

a. A: It is difficult to locate the point in space.

B: Yes, ……

b. A: It was very necessary to produce that information.

B: Yes, ……

c. A: It will be interesting to find that result.

B: Yes, ……

d. A: It is important to discuss the problem today.

B: Yes, ……

e. A: It was easy to solve the problem.

B: Yes, ……

10. **Indefinite pronouns**

Indefinite pronouns refer to people or things generally rather than specifically. They are used when the speaker or writer does not know or doesn't have to say exactly who or what is referred to.

1. **Complete the column with the indefinite pronouns**.

	One	Body	thing	where
Some	Someone	somebody	something	somewhere
Any				
No				
every				

2. **Fill in the gaps with one of the definite pronouns above**.

a. We know …… about his work.

b. Was there …… sign between these numerals?

c. …… confuses these basic terms.

d. …… is ready for the experiment.

e. Did you find the same result ……?

f. …… knows this familiar theorem.

g. There is not …… here who knows this subject.

h. You can find this book ……

i. There are not …… books on mathematics there.

j. …… of our students, will take their exams today.

11. **Use the words in capitals to form a word that fits in the spa**ce.

The (1) … (DISCOVER) of oil in the Middle East has made these countries both wealthy and politically (2) … (POWER). In 1973, the countries formed OPEC which proved to be a useful (3) … (ECONOMY) move as they had the (4) … (ABLE) to control both oil supply and prices. It also gave them international (5) … (RECOGNISE) and they have kept a good (6) … (SAFE) record in a dangerous industry.

12. **Choose the correct answer**.

1. Some rooms don't have light curtains on the windows, they have … instead.

a) carpets b) glass c) blinds d) wallpaper

2. He made a swift … from his illness.

a) repair b) survival c) relirf d) recovery

3. I … you to go to the Town Hall and ask them for information about it.

a) advertise b) announce c) notice d) advise

4. He wasn't admitted to the club because he wasn't a … .

a) partner b) member c) fellow d) representative

5. She has bought some lovely … to make herself a dress.

a) material b) clothing c) costume d) pattern

6. The students are staying at the youth … in Market Street.

a) home b) lodge c) hostel d) house

7. It's no use ringing me at the office this week because I'm … .

a) by my leave b) at leave c) in holidays d) on holiday

8. Jack walked into the room wih a gun in … hand.

a) both b) any c) either d) every

9. I had … a hundred offers for my house.

a) no b) each c) all d) no less than

10. People say that there is … like show business.

a) all business b) no business c) not business d) a business

Text 2

1. 1**. Pre – reading task Here are some words related to geometry**:

point, endpoint, line, line segment, ray, subset

Check that you understand their meanings. Fill in the gaps using the words above.

1. We can name the ……by using Latin alphabet letters.
2. ↔ is the symbol of …… AB.
3. The symbol AB is used for ……AB.
4. The two ……at each end of a…… segment are called ……...
5. AB is used for …… AB.
6. The Egyptians were mostly concerned with applying geometry to their everyday problems. YA part of a line is a ……of a line.

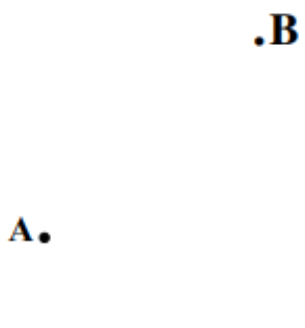
2. **Read the passage below.**

POINTS AND LINES

Geometry is a very old subject. It probably began in Babylonia and Egypt. Men needed practice, as the knowledge of the Egyptians spread to Greece, the Greeks found the ideas about geometry very intriguing and mysterious. The Greeks began to ask “Why? Why is that true?”. In 300 B.C all the known facts about Greek geometry were put into a logical sequence by Euclid. His book, called Elements, is one of the most famous books of mathematics. In recent years, men have improved on Euclid’s work. Today geometry includes not only the shape and size of the earth and all things

on it, but also the study of relations between geometric objects. The most fundamental idea in the study of geometry is the idea of a point and a line.

The world around us contains many physical objects from which mathematics has developed geometric ideas. These objects can serve as models of the geometric figures. The edge of a ruler, or an edge of this page is a model of a line. We have agreed to use the word line to mean straight line. A geometric line is the property these models of lines have in common; it has length but no thickness and no width; it is an idea. A particle of dust in the air or a dot on a piece of paper is a model of a point. A point is an idea about an exact location; it has no dimensions. We usually use letters of the alphabet to name geometric ideas. For example, we speak of the following models of point as point A, point B.

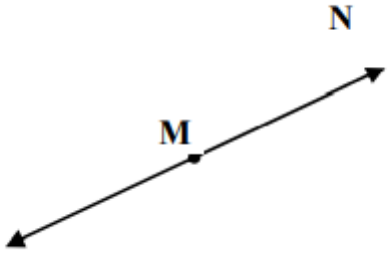


We speak to the following as line AB or line BA.

The arrows on the model above indicate that a line extends indefinitely in both directions. Let us agree to use the symbol ↔ to name a line. $\overleftrightarrow{AB}$ means line AB. Can you locate a point C between A and B on the drawing of $\overleftrightarrow{AB}$ above? Could you locate another point between B and C? Could you continue this process indefinitely? Why? Because between two points on a line there is another point. A line consists of

a set of points. Therefore a piece of the line is a subset of a line. There are many kinds of subsets of a line. The subset of $\overline{AB}$ shown above is called a line segment. The symbol for the line segment AB is $\overline{AB}$. Points A and B are the endpoints, as you may remember. A line segment is a set of points on the line between them. How do line segment differ from a line? Could you measure the length of a line? Of a line segment? A line segment has definite length but a line extends indefinitely in each of its directions.

Another important subset of a line is called a ray. That part of $\overline{MN}$ shown below is called ray MN. The symbol for ray MN is $\overline{MN}$.



A ray has indefinite length and only one endpoint. The endpoint of a ray is called its vertex. The vertex of $\overline{MN}$ is M. In the drawings above you see pictures of a line, a line segment and a ray – not the geometric ideas they represent.

3. **Read and translate the following words. Make up sentences with them**.

To spread, mysterious, sequence, to improve, a shape, a size, the Earth, a point, to serve, a geometric figure, an edge, a ruler, a page, to agree, a straight line, length, thickness, width, a particle, a dot, an exact location, an arrow, to indicate, to extend, indefinitely, a direction, a subject, to remember, to differ, to measure, a ray, a vertex.

4. **Name in one word**:

1. if news or information gets around, people tell other people, so that soon many people know about it;

2. to become better;

3. how big or small something is;

4. the part of something that is nearest to its outside or end;

5. to have the same opinion;

6. the distance from one side of something to the other;

7. something that is talked about or written about, for example at a meeting, I an essay or newspaper article, or in a conversation;

8. when you did something or used something, the thought of it comes back into your mind;

9. to find out the size or amount of something, by using a special tool, machine, or system;

10. a small, round mark on a line, plan, or map to show the position of something.

5. **Give the synonyms to the following words**:

- to stretch, to extend, to enlarge, to broaden –
- unexplainable, unknown, supernatural –
- a form, a design –
- to be of use to, to be useful, to meet requirements –
- border, side, boundary, outer limit –
- to be of the same mind/opinion –
- direct, uncurving –
- a tiny piece, atom, molecule –

6. **Translate the sentences from Ukrainian into English**:

1. Вогонь швидко поирився по будівлі.

2. Хтось знову поширює брехню про неї.

3. Дуякі хвороби поширюються комазами.

4. Я хотів удосконалити свою англійську мову, тому влаштувався на роботу в Лондон.

5. Поклади в суп трохи солі. Це покращить його смак.

6. Покращено автомобільне та залізничне сполучення.

7. Якої форми басейн?

8. Ваш робочий стіл точно такого ж розміру, як мій.

9. Ціна килима буде залежати від його розміру та якості.

10. Не наближайтесь до краю води.

11. Вони живуть у маленькому будиночку на краю міста.

12. Я погоджуюсь з тобою щодо кольору – це жахливо.

13. Єдине, про що всі партії домовились, - ц необхідність чесних виборів.

14. Я прочитав багато книг по астрономії. Це дуже цікава тема.

15. Я бачив, що він був збентежений, тому я зінив тему.

16. З'єднайте точки A і B на схемі разом прямою лінією.

7. **Are the statements True (T) or False (F)? Correct the false sentences.**

1. A point is an idea about any dot on a surface.

2. A point does not have exact dimension and location.

3. We can easily measure the length, the thickness and the width of a line.

4. A line is limited by two endpoints.

5. A line segment is also a subset of a line.

6. Although a ray has an endpoint, we cannot define its length.

8. Answer the following questions.

1. Where did the history of geometry begin?

2. Who was considered the first starting geometry?

3. What was the name of the mathematician who first assembled Greek geometry in a logical sequence?

4. How have mathematicians developed geometric ideas?

5. Why can you locate a point C between A and B on the line $\overline{AB}$?

6. How does a line segment differ from a line, a ray?

9. Based on the reading text, continue the following definitions.

1. A point is …… .

2. A line is ……... .

3. A line segment is …… .

4. A ray is …… .

10. **Use the words in capitals to form a word that fits in the space**:

It's not always easy being a (1) …(TOUR). You spend half your time making (2) …(ARRANGE) for your holiday and the other half worrying about sticking to the (3) … (TIME). I think it's relaxing sometimes to spend a holiday at home. There are no (4) … (CULTURE) problems, you don't need someone to be the (5) … (PHOTOGRAPH) and you know that the local (6) … (INHABIT) are always friendly!

11. Choose the correct answer:

1. Twenty-four hours … a long time in politics.

a) is b) are c) have d) has

2. This car is our … .

a) editor-in-chief b) editor's-in-chief's

c) editor's-in-chief d) editor-in-chief's

3. The teacher gave us … homework to do.

a) several b) a lot of c) many d) a few

4. We're out of … coffee, so could you get some from the supermarket?

a) a b) an c) the d) –

5. Do you think that they'll ever send a manned mission to … Venus?

a) a b) an c) the c) –

6. Could you help me with … exercises I don't understand?

a) few b) a few c) little d) a little

7. Everyone had … a good time when we went bowling that we agreed to go again.

a) so b) such c) enough d) too

8. We couldn't find a hotel room so we … sleep in the car. It was awful!

a) must b) should c) had to d) could

9. I didn't expect our history teacher … us so much homework.

a) giving b) give c) to give d) to giving

10. The man might have got away with the crime if the policeman … him.

a) wasn't seeing b) hadn't seen c) didn't see d) wouldn't have seen

Text 3

1. Read and translate the following passage.

SOME ADVICE FOR BUYING A COMPUTER

Computers can do wonders, but they can also waste a lot of your money unless careful consideration goes into buying them. People thinking of buying a computer system should admit that they know very little about computers. They must realize that the computer sales people don't always know how their business works.

It is essential that buyers should get outside advice, not necessarily from consultants but from other executives who have had recent experience in buying a computer system. Also, they have to see systems similar to ones under consideration in operation. Because their operations will have differences that must be accommodated, they should find out what would be involved in upgrading a system.

The important thing to know before buying a computer is the financial situation of the supplier because computer companies come and go and not all are financially stable. The prospective buyer should demand that every detail be covered in writing, including hardware and software if they are supplied by different companies. There's nothing wrong with computers themselves, it's how and why they are used that can cause problems.

2. Read and translate the following words. Make up the sentences with them.

To wonder, advice, to waste money, a careful consideration, to admit, to realize, essential, an executive, an experience, similar, to be under consideration, to accommodate, to find out, to be involved, to upgrade, a supplier, to demand, hardware, software, to supply, to cause

3. Match the words on the left with their definition on the right.

1. advice	a) to say that you have done something wrong or illegal;
2. to waste	b) to make something happen, especially something bad;
3. careful	c) a person or organization that provides something needed

4. to admit 5. to realize 6. experience 7. to find out 8. to cause 9. to upgrade 10. a supplier	such as a product or service; d) telling someone what you think they should do, especially when you have more knowledge or experience than they have; e) something that happens to you or something that you do, especially something unusual or important that you remember and learn from; f) someone who tries to avoid danger, risks, or accidents; g) to make improvements to something or exchange it for a better version; h) to notice or understand something that you did not notice or understand before; i) to use time, money, food etc in a way that is not useful or sensible; j) to get information about something, either by chance or by deliberately trying to get it.

4. Fill in the new vocabulary into the sentences:

1. Tim only … his mistake the next day.
2. I … 40 minutes waiting for a bus this morning.
3. Dad was really mad at me when he … where I'd been.
4. You should always be very … when handling chemicals.
5. Don't leave the light on – you're … electricity.
6. Without … it, we had gone the wrong way.
7. During her trip she has several frightening … .
8. He finally … he had stolen the money.
9. Everything will be OK with Jane – she's a very … driver.
10. The hospital has refused to … responsibility for his death.
11. He later wrote a book about his … as a war reporter.

12. I'll go and … which platform the train leaves from.

13. Smoking … cancer.

14. The fire … $30,000 worth of damage.

15. They have not yet … **to** fully digitial technology.

5. **Complete sentences using *should, must* or *have to* with the verb in brackets**.

1. It has been required that he ……(read) his paper at the seminar.

2. After finding the solution, we ……(say) that axiom and its properties are important enough.

3. Scientists ……(develop) this branch of mathematics, I think.

4. She ……...(summarize) the result before she reports it to her boss.

5. You ……(distinguish) between maths objects e.g. numbers, sets of numbers, functions, mappings, transformations, etc.

6. The two rays of an angle ……...(not lie) on the same straight line.

7. I think you ...……(illustrate) this problem in the figure. This may be the easiest way.

8. In geometry, set notation and language …… (clarify) matters.

9 A polygon …… (not have) less than 3 segments.

6. **Fill in the gaps using a modal + have + past participle**.

1. Algebraic formulas for finding the volumes of cylinders and sphere ……(be used) in Ancient Egypt to compute the amount of grain contained in them.

2. The discovery of the theorem of Pythagoras ……(hardly make) by Pythagoras himself, but it was certainly made in his school.

3. Regardless of what mystical reasons ……(motivate) the early Pythagorean investigators, they discovered many curious and fascinating number properties.

4. Imaginary numbers ……(be looking) like higher magic to many eighteenth century mathematicians.

5. The symbol √ ……(be used) in the sixteenth century and it resembled a manuscript form of the small r (radix), the use of the symbol √ for square root had become quite standard.

6. Descartes' geometric representation of negative numbers …… (help) mathematicians to make negative numbers more acceptable.

7. **Two colleagues are rearranging a meeting. Complete the conversation with: *can / can't , be able to / been able to* and then work in pairs to practice the dialogue.**

Helen: Jane, I'm afraid that I won't be able to see you on Friday. I've got to see some clients and they _____ make it any other time.

Jane: Don't worry, we _____ easily meet next week. How would Tuesday morning suit you?

Helen: That's fine. I _____ come and pick you up at the station.

Jane: That's very kind of you, but my car will be back from the garage, so will _____ drive up.

Helen: I'm sorry about the delay.

Jane: That's fine, really. I haven't _____ do much work on the proposal, and now I've got an extra weekend. I'll look at it in more detail.

8. **Use the words in capitals to form a word that fits in the space**:

I had a really stupid (1) … (ARGUE) with my best friend the other day. It all started because we were talking about (2) … (MARRY) and having a family. I said that (3) … (POLITE) is important when you are married and she said that she thought that was rubbish and that (4) … (KIND) is much more important. Well, we were (5) … (ABLE) to agree and, in the end, she left without saying goodbye. I do hope it doesn't spoil our (6) … (FRIEND).

9. **Choose the correct word**:

1. My Indian friend … it is wrong to eat meat.
   a) is thinking b) thought c) thinks d) has been thinking
2. You … partners for a long time. How long exactly?

a) were b) had been c) have been d) are

3. Ian … a shower at the moment, so could you call back in about half an hour?

a) takes b) is taking c) has taken d) has been taking

4. The first thing we noticed when we entered the house was the incredible mess that the robbers … .

a) make b) made c) have made d) had made

5. "Oh, no! I forgot my keys!" – "You … your keys!"

a) always forget b) always forgot

c) are always forgetting d) have always forgot

6. The hotel where we are … at is quite nice.

a) living b) remaining c) existing d) staying

7. Sam had to … because of the poor working conditions.

a) resign b) fire c) sack d) dismiss

8. If you want antibiotics, you'll have to ask your doctor for a … .

a) note b) prescription c) receipt d) recipe

9. There is a pack of … vegetables in the freezer, I think.

a) freezing b) frozen c) iced d) icy

10. Don't shout at her! She is very … and may start crying.

a) responsive b) sensible c) sensitive d) responsible

Test 4

1. Pre – reading task 1.1 Use your dictionary to check the meaning of these words.

theorem (n.) stretch (v.) total (adj.)

region (n.) ancient (adj.) area (n.)

2. Fill in the gaps using the words above.

a. – Why do you have to …… these ropes?

– To hang up these wet clothes.

b. The proof of the ……..…… stated seemed rather complicated.

c. The ……Egyptians believed that light travels from our eyes to the objects we look at, rather than from the objects to our eyes.

d. The kitchen has a / an ……..of 12 square metres.

e. The sum of the four triangles makes the …… area of this square.

f. This …….of the area is dashed.

3. Read and translate the text:

Mathematics and Computers

It is well-known that the development of computers and computer science was due to the effort of mathematicians, physicists, and engineers. But the early, theoretical work came from mathematicians.

The English mathematician Alan Turing, working at Cambridge University, introduced the idea of a machine that could perform mathematical operations and solve equations. The Turing machine, as it became known, was a precursor of the modern computer. Through his work, Turing brought together the elements that form the basis of computer science: symbolic logic, numerical analysis, electrical engineering, and a mechanical vision of human thought process.

Computer theory is associated with the name of the outstanding scientist von Neumann, who established the basic principles on which computers operate.

The first large-scale digital computers were pioneered in the 1940s. In 1945, von Neumann completed the EDVAC (Electronic Discrete Variable Automatic Computer) at the Institute of Advanced Study in Princeton. In 1946, the engineers John Eckert and John Mauchly built ENAC (Electronic Numerical Integrator and calculator), which operated at the University of Pennsylvania.

Complex computers have attracted the attention of researchers in the field of artificial intelligence. They are trying to develop computer systems that can imitate human thought processes.

The mathematician Norbert Wiener, who worked at the Massachusetts Institute of Technology (MIT), also became interested in automatic computing and developed the field known as cybernetics. Cybernetics grew out of Wiener's work

on increasing the accuracy of bombsights during World War II. From this, came a broader investigation of how information can be translated into improved performance. Cybernetics is now applied to communication and control systems in living organisms.

Computers have exercised an enormous influence on mathematics and its applications. They have given great impetus to such branches of mathematics as numerical analysis and finite mathematics. Computer science has suggested new areas for mathematical investigation, such as the study of algorithms. Computers have also become powerful tools in diverse fields, such as number theory, differential equations, and abstract algebra. In addition, the computer has made possible the solution of several long-standing problems in mathematics which were proposed in the previous centuries.

5. **Read and translate the following words. Make the sentences with them**.

   To be well-known, development, a science, due to, an effort, a physicist, to introduce, an equation, a precursor, a vision, to be associated with, outstanding, to establish, digital, to attract attention, a researcher, artificial intelligence, to increase, an investigation, to improve, to apply, enormous, an influence, application, impetus, finite mathematics, a powerful tool, diverse, to propose

6. **Name in one word**:
   1. to become larger in number, amount, price, value etc.;
   2. to become better;
   3. a person, organization or country that has a lot of power, and can control people and influence events;
   4. a thing that you hold in your hand and use to repair, cut, or make something;
   5. known or recognized by many people;
   6. the process in which someone or something grows or changes and becomes more advanced;

7. a systematically organized body of knowledge on a particular subject;
8. physical or mental activity needed to achieve something;
9. to be connected with something in some way;
10. to draw by appealing to the emotions or senses, by stimulating interest, or by exciting admiration.

7. Give the synonyms to the following words.

- famous, famed, familier –
- growth, evolution, progress –
- area of study –
- thanks to, because of –
- to present –
- man-made, unnatural –
- to put into practice –
- huge, massive, gigantic –
- impact, effect –
- various, different, contrasting -
- goal, aim, target -

8. Translate the sentences from Ukrainian into English:

1. Поступово шум і транспорт збільшувалися із наближенням до міста.
2. За останні роки використання мобільних телефонів надзвичайно зросло.
3. У Дувіда нова робота, тож справи йдуть на краще.
4. Її вчитель каже, що хх шкільні завдання стають все кращими та ращими.
5. Парламент став могутнішим за короля.
6. Він не міг закінчити ремонт двигуна, боне мав відповідних інструментів.
7. Я тримаю всі свої інструменти в гаражі.
8. Її погляди на цю тему вже добре відомі.

9. Загальновідомо, що він ніколи не дає інтерв'ю.
10. Ресторан добре відомий своєю доброзичливою атмосферою та чудовим сервісом.
11. Документальний фільм простежував розвиток популярної музики протягом століть.
12. Космічні подорожі – одне з чудес сучасної науки.
13. Він доклав чимало зусиль, щоб вчасно закінчити проект.
14. Гравітаційна сила Землі притягує до неї менші тіла.
15. Його соціальні проблеми були пов'язані з пияцтвом.

9. **Answer the following questions.**

1. What is the role of mathematicians in the development of computers and computer science?
2. Who was the idea of a computer introduced by?
3. Who is computer theory associated with?
4. When were the first large-scale digital computers pioneered?
5. Who was the first electronic numerical integrator and calculator built by?
6. Whose name is Cybernetics associated with?
7. What influence have computers exercised on mathematics and its applications?

10. **Use the words in capitals to form a word that fits in the space**:

Finding a top class hotel in London is not difficult. One of the best is Manchester hotel, a (1) … (MEET) point for celebrities and business people. It is (2) … (CENERAL) known for its superb (3) … (ACCOMMODATE). Being a top-class hotel, it is fairly (4) … (EXPENSE). At certain times of the year it is difficult to get a (5) … (RESERVE), but if you are lucky, the (6) … (MANAGE) will be able to find you a room.

11. **Choose the correct answer**:

1. He rented a well-equipped … with all modern conveniences.

a) pool b) garage c) garden d) flat

2. It's a nice dress. It … you perfectly.

a) suits b) costumes c) matches d) goes

3. I … to inform you that there's nothing we can do to help you.

a) sorry b) respect c) resent d) regret

4. … I didn't understand the job but now I'm making progress.

a) On the beginning b) For a start c) At first d) In principle

5. I … him some money and must pay him back tomorrow.

a) debt b) borrow c) owe d) own

6. The … for the first class passengers will soon increase.

a) fee b) salary c) wage d) fare

7. I feel so tired this evening because I've been working hard … .

a) all day b) every day c) each day d) day by day

8. The two cars for sale were in poor condition, so I didn't buy … .

a) either of them b) both of them c) neither of them d) each of them

9. The room was full of people and … were working.

a) neither of them b) all of them c) each of them d) all

10. My friend Peter has a gold earring in … .

a) his two ears b) each ear c) every year d) the ears

Text 5

1. Read the text below and do the tasks following it.

Choose the title to the text that suits best:

1. Computer applications
2. The age of modern computer technologies
3. The role of the computer in work and studies

Computers have become a part of our everyday life. We use them to do different mathematical and logical operations, to receive, store and transfer any kind of information, to work on the Internet, write e-mail letters, speak over the Skype, etc. We daily deal with different computer systems, such as calculators, car electronics, mobile phones, timers in microwave ovens or washing machines, programmers inside the TV sets and so on. The impact of the computer on our society is felt in

every area – government, business, science, medicine, sport, industry, agriculture, entertainment and leisure activities.

The computer is a high-speed calculating machine which speeds up your financial calculations. It is an electronic notebook which manages to collect tremendous quantities of data, such as databases of any school or university, studying programs, personal information, etc. It is a unique typewriter that allows every user to type and print any kind of written document, pictures or even photos. It is the greatest electronic entertainment system, so you can relax listening to your favoutite music or watching your favourite film, or playing computer games. And finally, the computer is a personal communicator that enables us to communicate with other people all over the world without leaving your house.

2. Read and translate the following words. Make up the sentences with them.

To receive, to store, to transfer, to deal with, a microwave oven, a washing machine, an impact, a society, a government, a cience, agriculture, entertainment, leisure activities, speed, to manage, tremendous, quantity, data, databases, unique, to allow, to print, to relax, favourite, communicator, to enable

3**. Match the words on the left with their definition on the right**:

1. to deal with 2. government 3. to relax 4. favourite 5. to receive 6. to store 7. an impact 8. agriculture 9. entertainment 10. tremendous	a) the science, art and practice of cultivating plants and livestock; b) the people who govern a country, state, or local area, and who make all the important decisions about taxes, laws, relations with other countries etc; c) to put or keep things in a special place for use in the future; d) the colour, food etc.that someone likes better than any other colour, food etc.; e) extraordinarily large in size, extent, amount, power, or degree; f) to decide what needs to be done and make sure that it is

	done, especially when it is your job to do this; g) a form of activity that holds the attention and interest of an audience or gives pleasure and delight; h) to get or be given something; i) to make yourself feel calmer, more comfortable, and less worried, by resting or doing something enjoyable; j) a powerful effect that something, especially something new, has on a situation or person.

4. **Fill in the new vocabulary into the sentences:**

1. Who is … the accommodation arrangements for the conference?
2. They received a visit from the police.
3. Who is your … singer?
4. I spend most of my working day … customer inquiries.
5. I … my possessions in my mother's house while I was living in Spain.
6. The … promised to cut taxes.
7. Trained staff will look after your children, so that you can … and enjoy yourself.
8. I've … my thick sweaters and jackets (away) until next winter.
9. Unemployment is a problem that faces most western … .
10.. We’re going to her … restaurant for a meal.
11. Squirrels … (up) nuts for the winter.
12. I … a phone call from your mother.
13. The French … has banned the sale of British beef.
14. Just wait! In two weeks time I’ll be … on a beach in Greece.
15. My … colour is purple.
16. Did you … my letter?
17. The data is … on a hard disk and backed up on a CD.

18. This decision will have a disastrous … on foreign policy.

19. This film is a good family … .

20. They were making a tremendous amount of noise last night.

5. **Give your answers to the following questions.**

1. What are the main spheres of computer usage?

2. What areas of human activity are affected by the computer?

3. Why is the computer so important in our life?

4. How do you use the computer in your every day life?

5. What recommendations could you give to those who use the computer in a big way?

6. Put the adjectives in brackets into the correct form (comparative or superlative degree) to make an accurate description of computer sizes.

There are different types of computer. The ... (large)[1] … and ... (powerful)[2] … are mainframe computers. Minicomputers are ... (small)[3] ... than mainframes, but are still very powerful. Microcomputers are small enough to sit on a desk. They are the ... (common)[4] … type of computer. They are usually ... (powerful)[5] … than minicomputers. Portable computers are ... (small)[6] … than desktops. The ... (large)[7] … portable is a laptop. ... (Small)[8] … portables, about the size of a piece of writing paper, are called notebook computers. Subnotebooks are ... (small)[9] … than notebooks. You can hold ... (small)[10] … computers in one hand. They are called handheld computers, or palmtop computers.

7. Put questions to the following sentences.

1. Chemists have found that 100,000 chemical reactions take place in the brain every second.

2. We still don’t know how languages are learnt.

3. We are only now really starting to learn the truth about how the human brain works.

4. As long as the brain is given plenty of exercise, it keeps its power.

5. It has been found that an old person who has always been mentally active has a quicker mind than a young person who has done only physical work.

6. The study of the physiology of memory is in its infancy, and researchers must thus still rely on analogy, on terms like storage and retrieval, to explain how we remember.

7. But even a rudimentary understanding of the physiology of memory is better than none at all.

8. Use the correct tense / voice form of the verb.

Model:

A lot of knowledge (*to accumulate*) in the second half of the 20th century.

A lot of knowledge *was accumulated* in the second half of the 20th century.

1. In the early ages, primitive counting (to do) with the help of gestures, objects, fingers and toes.

2. The work of Leibniz (to publish) several years before Newton's results appeared in print.

3. In the past, people could not foresee that their life (to change) radically due to technological advances.

4. Scientists (to make) their discoveries due to the achievements of their predecessors.

5. Mathematics (to be) a science of numbers before it became a science of relations.

6. Archimedes (to make) his discovery while (to take a bath).

7. All spheres of life (to benefit) from computers in the future.

8. Many problems of artificial intelligence (not to solve) yet.

9. A lot of useful gadgets (to appear) in the last 10 years.

10. Nowadays, science and technology (to develop) at a great speed.

11. It is believed that in the future computers (to make) people's life still more comfortable.

12. Mathematics (to contribute) the most to the development of computer science.

13. Without the computer, the present day achievements of many sciences (to be) impossible.

14. Very little (to know) to us about the life of Euclid.

15. Einstein (to be) young when he developed the theory of relativity.

16. Lobachevsky's new idea (to remain) unnoticed for a long time.

17. Till his dying day, Galileo was true to his ideas, though he (to renounce) them before under the pressure of the Inquisition.

18. Some new branches of mathematics (to develop) in the 20th century.

19. It (to take) mathematicians over three hundred years to prove Fermat's last theorem.

20. Mathematical language (to characterize) by its symbolic nature, brevity and precision.

9. Use the words in capitals to form a word that fits in the space:

Zfor the most (1) … (COMFORT) rooms in town, all available at extremely (2) … (REASON) rates, look no further than the Ross Hotel. You will always find a warm welcome here from our highly (3) … (PROFESSION) staff, who are keen to be (4) … (HELP) to guests at all times. Our dining room has an excellent reputation, particularly for the (5) … (TRADITIONAL) dishes of the region. Phone the number below to find out about our very low (6) … (DAY) rates and our rates per week.

10. **Choose the correct answer**:

1. I … to all the local newspapers and TV stations to complain.

a) already write b) already writing

c) have already written d) have already been writing

2. … TV for the last four hours? Turn it off and get some exercise!

a) Do you watch b) Are you watching

c) Watched you d) Have you been watching

3. Eric, … hockey competitively or just for fun?

a) do you usually play b) are you usually playing

c) have you usually played d) have you usually been playing

4. That's the first time … an answer right today!

a) I get b) I am getting c) I have got d) I have been getting

5. Jessica has … left, I'm afraid.

a) already b) yet c) still d) so far

6. It might be quite busy here during the tourist … .

a) season b) period c) phase d) stage

7. According to everyone in the … she is a very good boss.

a) apartment b) compartment c) department d) employment

8. Ann was in terrible pain so the nurse gave her a/an … .

a) scratch b) vaccine c) wound d) injection

9. There are no vegetable dishes on the … .

a) leaflet b) brochure c) catalogue d) menu

10. Their child is a very … little boy. His parents give him everything he wants.

a) generous b) patient c) spoilt d) loyal

Text 6

1. Read and translate the following text.

Circles

The circle has many properties which no other plane figure possesses. For example, it is symmetric with respect to its centre and with respect to any of its diameters. Of all the plane geometric figures, the circle is the only one which can be rotated about a point without changing its position.

The circle very well harmonizes in composition with other geometric figures. The circle is a very useful figure. Without using the circle there would be no watches, clocks, bicycles, automobiles or ships.

A circle is a closed plane curve, all points of which are equidistant from a point within, called the centre. Congruent or equal circles are circles that can be made to coincide. If two circles coincide, their centers coincide.

A radius of a circle is a line segment connecting the centre with any point on the circle. A chord is a line segment connecting any two points on the circle.

A diameter is a chord passing through the centre of the circle. A secant is a line which is obtained by intersecting a circle in two points. A tangent is a line touching a circle at one point, and only one. This point is called the point of tangency or point of contact. The line of centers of two circles is the straight line determined by the centers of the circles.

An arc of a circle is the part of a circle included between two of its points. An arc is usually named by its end points or by a small letter near it.

From definitions and a study of the circle we can state the following assumptions relating to a circle:

Circles having equal radii are equal, and conversely.

A point is within, on, or outside a circle if its distance from the centre is less than, equal to, or greater than the radius; and conversely.

Two minor arcs, or two major arcs, coincide if their end points and centers coincide; and conversely.

2. Read and translate the following words. Make up sentences with them.

A circle, a property, to possess, a plane figure, a respect, to rotate, useful, a curve, equidistant, a congruent circle, to coincide, to connect, a chord, a secant, to obtain, to touch, to determine, an arc of a circle, a definition, an assumption, to relate, conversely

3. Name in one word:

1. something that makes it easier for you to do something or to get something;
2. to put your fingers or hand onto someone or something;
3. a round shaped figure that has no corners or edges;
4. to have or own something, or to have a particular quality;
5. to cause to turn or move about an axis or a center;
6. a line that bends continuously and has no straight parts;

7. it refers to things that are approximately but not exactly the same distance apart;
8. two figures or objects that have the same shape and size, or if one has the same shape and size as the mirror image of the other;
9. a str a straight line cutting a curve at two or more points;
10. a straight line segment whose endpoints both lie on a circular arc.

4. Give the synonyms to the following words:

- to own –
- high opinion, approval –
- to go roung, to move round, to turn round –
- to occur simulteniously, to coexist –
- to join, to fasten, to attach –
- to be in contact, to come in contact –
- to decide, to agree on –
- meaning, explanation –
- supposition, guess –
- to be relavent to, to refer to -

5. Translate the sentences from Ukrainian into English:

1. Банк дав нам багато корисних порад щодо початку нашого нового бізнесу.
2. Поліція хоче поговорит из людьми, які бачили що-небудь, що може бути пов'язане зі злочином.
3. Більшість моїх проблем були пов'язані з роботою.
4. Ці дві мови тісно пов'язані.
5. Успіхи в школі тісно пов'язані з життям дитини вдома.
6. Не чіпайте тарілки – вони гарячі!
7. Минулого тижня я порізав коліно, і воно все ще болить, якщо доторкнутися до нього.
8. Тось рукою торкнувся її руки. Вона обернулась і побачила, що це Марія.

9. Діаметр проходить через центр кола.
10. У нього велике коло знайомих.
11. Намалюйте коло діаметром 10 см.
12. Раніше вважалося, що корінь цієї рослини має магічну силу.
13. Ми намагаємося виявити мистецькі таланти, якими володіє багато людей, не усвідомлюючи цього.
14. Вона вже продала все цінне, чим володіла.
15. Поверніть ручку на 180^0, чим володіла.
16. Колесо обертається навколо осі.
17. Супутник повільно обертається, обходячи землю.
18. Вона намалювала криву на папері.
19. Австралія приблизно на однаковій відстані від Афртки та Південної Америки.
20. Наші цілі співпадають; конфлікту немає.

6. Answer the following questions:

1. What are the properties of the circle?
2. When are circles called congruent?
3. What is an arc?

7. Turn direct speech into indirect (reported) speech.

1. Plato advised, “The principal men of our state must go and learn arithmetic, not as amateurs, but they must carry on the study until they see the nature of numbers with the mind only.”

2. Descartes, father of modernism, said, “All nature is a vast geometrical system. Thus all the phenomena of nature are explained and some demonstration of them can be given.”

3. In Descartes’ words, “You give me extension and motion then I’ll construct the universe.”

4. The often repeated motto on the entrance to Plato’s Academy said, “None ignorant of geometry enter here.”

5. J.Kepler affirmed: " The reality of the world consists of its maths relations. Maths laws are true cause of phenomena. "

6 I.Newton said, " I don't know what I may appear to the world; but to myself I seem to have been only like a boy playing on the seashore, and diverting myself now and then by finding a smoother pebble or a prettier shell than usual; whist the great ocean of truth lay all undiscovered before me. If I saw a little farther than others, it is because I stood on the shoulders of giants ".

8. Who said what? Match the words to the people and report what they said.

a. Mrs. Thatcher	1. "All the world's a stage."
b. Stokeley Carmichael	2. "Black is beautiful."
c. Galileo	3. "Big Brother is watching you."
d. Shakespeare	4. "There is no such thing as society."
e. George Orwell	5. "The earth moves round the sun."

a. ……

b. ……

c. ……

d. ……

e. ……

9. Choose the best answer.

Example: What did that man say ……3……?

1) at you 2) for you 3) to you 4) you

a. I rang my friend in Australia yesterday, and she said it … raining there.

1) is 2) should be 3) to be 4) was

b. The last time I saw Jonathan, he looked very relaxed. He explained that he'd been on holiday the …… week.

1) earlier 2) following 3) next 4) previous

c. Someone …… me there's been an accident on the motorway.

1) asked 2) said 3) spoke 4) told

d. When I rang Tessa some time last week, she said she was busy ….....day.

1) that 2) the 3) then 4) this

e. Judy …… going for a walk, but no one else wanted to.

1) admitted 2) offered 3) promised 4) suggested

f. When he was at Oliver's flat yesterday, Martin asked if he …… use the phone.

1) can 2) could 3) may 4) must

10. Read the report about what a candidate said at an interview. Change the words in italic into direct speech.

Miss Lan said that *she was very interested in teaching there*, and she explained that *she had been working in a department of maths for three years*. When I asked her about her reasons for leaving, she said that *she liked young people and she wanted more responsibility*. She seems well qualified in the computer, as she said that she *had a degree in Informatics–Maths*. As far as her terms of notice are concerned, she made it clear that she *couldn't leave her job for another month*. I decided to offer her the job, and she said she *would consider our offer, and would let us have her decision soon*.

Example:

A: – She said she was very interested in teaching there.

B: – "I'm very interested in teaching here."

11. Except for two cases we have known, a lot of Latin and Greek original nouns also have the plural forms ending in –i (e.g. *calculus – calculi*) and –ae (e.g. *abscissa – abscissae*). Look at the nouns below:

focus, formula, corona, genius, locus, hyperbola, lacuna, radius, nebula, modulus, nucleus, rhombus.

12. Fill in the gaps using the words above.

1. Two equations are called equivalent if they have the same ……

2. Up until quite recently, when functions were mentioned in the mathematical literature they were usually considered to be ……

3. In the figure, we can sketch the …… determined by an equation of the form.

4. The simplest ……, that of common hydrogen, has a single proton.

5. The area of an ellipse equals π/4 times the product of the long and the short diametres or π times the product of the long and the short …… .

♦ Note

Besides that, some nouns always have similar forms, example:

an apparatus – apparatus

a headquarters – headquarters

a means – means

news – news

a series – series a species – species

13. Use the words in capitals to form a word that fits in the space:

(1)… (ENVIRONMENT) problems such as freak weather conditions, fire and acid rain are resulting in the (2) … (DESTROY) of vast areas of woodland and forest. These areas are homes to large numbers of animals and, as the land is vital for their (3) … (SURVIVE), this is having (4) … (ALARM) effects.

(5) … (ECOLOGY) advocate the use of ozone-friendly products and, of course, recycling to achieve a (6) … (REDUCE) in environmental demage.

14. Choose the correct answer:

1. Pete's Bar is situated in Terminal 1 at … Hearthrow Airport.

a) a b) an c) - d) the

2. The Browns were the first to leave … party at midnight.

a) a b) an c) - d) the

3. … homelrss in our town are being helped by young people.

a) a b) an c) - d) the

4. The government is cutting benefits for … unemployed.

a) a b) an c) - d) the

5. The staff … worried about their jobs.

a) is b) are c) - d) be

6. You've got … beautiful furniture.

a) some b) both c) many d) any

7. I can … believe that he has gone. Surely he wouldn’t have left without me!

a) harder b) hard c) hardly c) in a hardly way

8. Ugh! This soup tastes just … water. Didn’t you make it as I told you?

a) like b) as c) such a d) a few

9. Not many people believe that … private lives are their own business.

a) politician’s b) politician c) politicians’ d) politicians’s

10. Hard work … the key to success.

a) is b) are c) do d) have

15. **Translate the sentences into English.**

1. Виконайте множення, а потім віднімання наступних чисул: 135 × 7 – 210.

2. Видайте підсумок і зведіть отримане число в третю ступінь.

3. Знайдіть квадратний корінь з числа 64.

4. Розумні операції, що здійснюються комп'ютерною системою, бувають математичними і логічними.

5. Сучасний комп'ютер може виконувати понад мільйон різних розумних операцій в секунду, наприклад, таких як додавання, віднімання, множення, ділення, сортування, узгодження, порівняння або вибір.

6. Будь-яка інформація для комп'ютера повинна бути представлена в двійковій системі.

7. Адреса будь-якої інформації - це назва певної комірки пам'яті, в якій вона збережена.

8. Чим більше внутрішня пам'ять комп'ютера, тим більше дій на ньому можна виконувати.

16. Use the special questions in indirect speech according to the model.

Model: 1. What do you specialize in?

You’ve asked me what I specialize in.

2. What is the article about?

You’ve asked me what the article is about.

1. What conclusion was drawn?

2. When was the discovery made?

3. Where did the scientist live during World War II?

4. Which experiment in this article deals with our mental habits?

5. Where did he go to study higher mathematics?

6. Where will he work upon graduation?

7. Why do we habitually link together a person and his name?

8. When was the connection between man’s classifying instinct and mathematics recognized?

9. Why can mathematics be applied to the world around us with relative ease?

10. Who was the law of gravitation discovered by?

11. How did people count in the early ages?

12.How long did it take them to create the first computer?

17. **Translate from Ukrainian into English.**

1. Прикладні програми наводяться в дію тільки після установки системного забезпечення.

2. Програми комп'ютера поділяються на системне програмне забезпечення і програмне забезпечення по застосуванню (прикладні програми).

3. Системне програмне забезпечення контролює всі стандартні дії комп'ютера, такі як включення і виключення, завантаження програм, інформування про обсяг пам'яті і т. д.

4. Програмне забезпечення містить всі програми і команди комп'ютера.

5. Периферійні пристрої включають вводний, вихідний блоки і внутрішній пристрій.

6. В системне програмне забезпечення входять драйвери для апаратного обладнання, лінкери і відладчики.

7. Комп'ютерна система складається з апаратного обладнання та програмного забезпечення.

8. Прикладні програми класифікуються за сферою застосування.

9. Внутрішній запам'ятовуючий пристрій використовується для постійного зберігання інформації і програм.

10. Деякі прикладні програми мають властивості, які призводять до небажаних наслідків.

18. Use the general questions below in indirect speech. Follow the model.

Model: Did the hypothesis prove to be correct?

You've asked me if the hypothesis proved to be correct

1. Does the image of a man usually accompany his name?
2. Is there a connection between the works of mathematicians of all times?
3. Do you visualize a man when hearing his name?
4. Was the theory of relativity a turning point in physical thinking?
5. Has Fermat's last theorem been proved?
6. Was the hypothesis based on the wrong assumption?
7. Does the new method have any advantages over the old one?
8. Do these two phenomena have anything in common?
9. Does he seem to have changed his point of view?
10. Do the results which have been obtained agree with the results that were expected?
11. Did you hear him speak at the conference?
12. Does this law hold for all similar cases?
13. Did you see him switch off the computer?
14. Was Christopher Columbus the first to have travelled from Europe to America?
15. Was your purpose to gain some time?
16. Will you make a report at the seminar?
17. Did you wish to express the same idea in a different way?
18. Did Einstein develop an absolutely new idea of the world we live in?

19. Fill in the blanks with appropriate prepositions: *at, for, in, out, to, of, on, with, by, from*. One preposition may be used several times.

The part …the computer that puts … information is called the output unit. The computer can easily put … information … the form acceptable … people – hardcopy or softcopy forms. The hardcopy output can be held … your hands, such as paper: the text or pictures printed … it. A softcopy is displayed … a monitor. The output unit is varying according … the capacity … the auxiliary equipment receiving information. But all peripherals are slow as compared … the computer. … this case, buffers are used. A buffer is a storage device which is able to accept information … a very high speed … the computer and release the information … the proper speed … the peripheral equipment.

20. Put questions to the following sentences.

1. New mathematical ideas are often developed with no thought of application.
2. The abstractions of mathematics are adopted by scientists to understand the patterns of nature.
3. Mathematical analysis continues to be essential to the development of algorithms.
4. Arithmetic originated with the question: “How much?”
5. Modern algebra has discarded several of the basic conventions of elementary algebra.
6. Einstein showed that Grassman had been 50 years ahead in his thinking.
7. Throughout the centuries, man has refined the ability to record, process, and communicate information.

21. Use the questions in indirect speech following the model (Sequence of Tenses).

Model: 1. They said, “We will go to the South”.

They said that they would go to the South.

2. She said, “I have done the test.”

She said that she had done the test.

3. They said, “We saw the film two years ago.”

They said that they had seen the film two years before.”

4. He said, “I am taking driving lessons.”

He said that he was taking driving lessons.

5. She said, “I was reading for the exam at that time.”

She said she had been reading for the exam at that time.

1. He said, “I am working on my diploma paper project.”
2. She said, “I haven’t been to the lecture.”
3. They said, “We won’t come to the party.”
4. She said, “We have installed a new antivirus program”.
5. He said, “I wrote the article three years ago.”
6. They said, “We won’t go to France.”
7. He said, “I was working at five o’clock.”
8. She said, “I have been waiting for you since three o’clock.”
9. They said, “The lecture will be held in the assembly hall.”

UNIT 4

Text 1

1. Read and translate the following passage.

MATHEMATICAL LOGIC

In order **to communicate** effectively, we must agree on the precise meaning of the terms which we use. **It's necessary to define** all terms to be used. However, **it is impossible to do this** since **to define** a word we must use others words and thus circularity can not be avoided. In mathematics, we choose certain terms as undefined and define the others by using these terms. Similarly, as **we are unable to define** all terms, we can not prove the truth of all statements. Thus we must begin by assuming the truth of some statements without proof. Such statements which are assumed to be true without proof are called axioms. Sentences which are proved to be laws are called theorems. The work of a mathematician consists of proving that certain sentences are (or are not) theorems. **To do** this he must use only the axioms, undefined and defined terms, theorems already proved, and some laws of logic which have been carefully laid down…

2. **Read and translate the following words. Make up the sentences with them**.

To agree, a precise meaning, a term, to define, impossible, circularity, to avoid, a statement, to prove, to assume, a proof, a law, to consist of

3. Name in one word:

1. to have the same opinion;
2. what a word, sign, or statement means;
3. something that cannot be done;
4. to make sure that something bad does not happen to you, either by doing something or by deliberately not doing something;
5. the official law that all the citizens of a country must obey;
6. exact and accurate;
7. a word or expression used in relation to a particular subject, often to describe something official or technical;

8. to say what the meaning of something, especially a word, is;
9. to be formed or made up of;
10. a logical argument that tries to show that a statement is true.

4. Give the synonyms to the following words:

- to be of the same mind/opinion, approve –
- exact –
- unimaginable, unachievanle –
- evidence, demonstration, confirmation –
- suppose –
- rule, act, decree, directive –
- to comprise, to contain, to include -

5. Translate the sentences from Ukrainian into English:

1. Більшість експертів сходяться на думці, що такі наркотики, як героїн, можуть спричинити постійне пошкодження мозку.
2. Слово ‘spring’ має кілька різних значень.
3. Ми повинні виконати цю роботу до завтра, але це неможливо.
4. Вуляця була вузькою, і двом автобусам було неможливо проїхати.
5. Слід уникати рішення, перш ніж не дізнаєшся всіх фактів.
6. Існує закон проти жорстокого поводження з тваринами.
7. Конгрес прийняв законб який дозволив жінкам стати пілотами у ВПС.
8. Він зловив мене в саме той момент, коли я знепритомнів.
9. Ваші права та обов’язки визначені у статуті громадян.
10. Ваша роль у проекті буде чітко визначена.
11. Сніданок складався із кашію фруктів та апельсинового соку.
12. Його гардероб майже повністю складається з джинсів та футболок.

6. **Rewrite these sentences following the model to make them more natural.**

Example: To say no to people is hard → It’s hard to say no to people.

1. To select two points on a line, labeling them and referring to the line in this way is more convenient.

2. To use colored chalk is more effective.

3. To memorize all of these relations is very difficult.

4. To distinguish the elements of a set from the “non elements” is very essential.

5. To point out that elements of a set need not be individual, but may themselves be sets is very important.

6. To determine the exact image in that case is impossible.

7. To have a more simplified system of notation is desirable.

8. To see that the meaning of an expression, depending on its context, is very clear.

9. To give your full name is compulsory.

10. To do the measuring as accurately as possible is very necessary.

11. To cut $\overline{MN}$ in two or three parts is permissible.

7. **Make sentences using the ideas given**:

– your writing / impossible / read

– useful / use / heating pad

– necessary / read carefully / theorem / beforehand

– silly / get upset / small things

– equation / difficult / solve

– important / drink / lots of liquids

– unfair / criticise him

8. Continue these sentences using the example.

Example: I like John very much. It’s very interesting to talk to him.

1. I must ask my teacher because …… .

2. You shouldn’t be annoyed about that. …… .

3. You write awfully. ……

4. I think he wasn’t intentional. ……

5. I’ve got a temperature …… .

6. Don’t hurry. You should look at the theorem first, …… .

7. What should you do for a backache? – …… .

9. Change the following sentences using to–infinitive for purpose.

Example: We have to subtract this number from the sum obtained because we want to check the result of addition.

→ To check the result of addition, we have to subtract this number from the sum obtained.

1. We must know the details because we want to understand the situation.
2. You must do the following because you want to operate this machine.
3. He put the figures in a table because he wants to look at the data.
4. He included the empty set at the beginning because he wants to have a complete table.
5. We made a conjecture and then proved this because we want to have the correct procedure.

10. **Match a line in A with a line in B.**

A	B
a. We apply the Euclidean algorithm	1. to denote sets.
b. We use the symbol ∈	2. let us use the unit circle.
c. We use the braces { }	3. to mean "is an element of".
d. To clarify this idea.	4. we return to one–dimensional geometry and line segments
e. To fix our thoughts	5. we must find a statement that conforms to the rule stated above.
f. We draw a picture	6. to express GCD as a linear combination.
g. To find the negation of some statements,	7. to show the physical realization on this vector sum.
h. In order to introduce the concept of measure,	8. we present some examples of set.

11. Complete the following sentences.

1. In order to speak English well ……
2. In order to communicate effectively ……..
3. In order to find the difference …….
4. To make sure that everything is correct ……
5. To become a good student …….
6. To get a scholarship …….

12. **Use the words in capitals to form a word that fits in the sp**ace:

A new kind of television (1) … (ENTERTAIN) has brcome a talking point in million of houses – reality TV shows. These came into existence a few years ago and have achieved enormous (2) … (POPULAR). These programs show the (3) … (BEHAVE) of ordinary members of the public in a variety of different situations – doing their jobs, trying to win talent (4) … (COMPETE), being faced with challenges so that their (5) … (REACT) can be observed and spending of period of time living in a house with (6) … (STRANGE).

13. Choose the correct answer:

1. All in all this is a fine … house in a quite residential area.

a) single b) detached c) alone d) only

2. An … agent showed them around a new house.

a) possessions b) belongings c) estate d) property

3. The … traffic made him late for work.

a) full b) strong c) thick d) heavy

4. This green skirt doesn't … your orange jacket.

a) agree b) match c) suit d) fit

5. She complained about a … in her left arm.

a) damage b) harm c) hurt d) pain

6. My former partner is looking for a/an … after his retirement.

a) work b) job c) occupation d) position

7. The train … York at 4.30 without any delay.

a) came b) got c) reached d) arrived

8. I looked everywhere for my pen and it was here … .

a) none of the time b) every time c) all the time d) each time

9. We have … time before the train leaves. Let's drink coffee.

a) little b) a little c) no d) few

10. It was a very expensive holiday. I spent … the money I had on me.

a) a whole b) the whole c) all d) much

Text 2

1. We know the noun "operation" (such as "the set operation" in the text) is formed by adding suffix –tion that has the meaning "the act of". Use suffix –tion or –ation to form the nouns from the following verbs:

interpret react locate

communicate concentrate represent

relate multiply

2. Read and translate the text.

THE COORDINATE PLANE

Now we want you to consider two sets: A and B, such that A = { a, b, c } and B = { d, e }. We will form a new set from sets A and B, which we will call the Cartesian product, or simply the product set, by forming all possible ordered pairs (x, y) such that x is from set A and y is from set B. This new set is denoted by A × B (read A cross B).

$$A \times B - \begin{Bmatrix} (a,d)\ ,\ (a,e) \\ (b,d)\ ,\ (b,e) \\ (c,d)\ ,\ (c,e) \end{Bmatrix}$$

Let us use the notation n (A) to mean the number of elements in set A and n (A × B) to mean the number of elements (ordered pairs) in A × B. Observe that n (A × B) = 6 and that n (A) = 3 and n (B) = 2. Since 3 × 2 = 6, we see there is a relationship of some importance between the set operation of forming the Cartesian

product and multiplication of numbers n (A) × n (B) = n (A × B). Now let us form B × A.

$$B \times A = \begin{Bmatrix} (d,a) , (d,b) , (d,c) \\ (e,a) , (e,b) , (e,c) \end{Bmatrix}$$

You may have noticed that no elements (ordered pairs) of B × A are the same as those of A × B, though their numbers are still the same. This means that A × B ≠ B × A, while n (A) × n (B) = n (B) × n (A). Forming the product set is a non-commutative operation. In this case it is a non- commutative multiplication.

In our next step we do something that at first will seem purposeless. Given that set A = { a, b, c } , we will form the new set A × A .

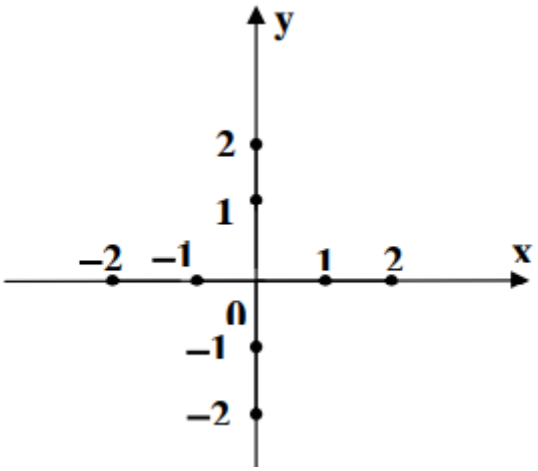
$$A \times A = \begin{Bmatrix} (a,a) , (a,b) , (a,c) \\ (b,a) , (b,b) , (b,c) \\ (c,a) , (c,b) , (c,c) \end{Bmatrix}$$

This is, of course, the Cartesian product of set A with itself, and you will wonder what you can do with it. Its use will become clear if we let X = { 0, 1, 2 } and let Y = { 0, 1, 2 }. Then find X = Y the Cartesian product of a set with itself since X = Y.

$$X \times Y = \begin{Bmatrix} (0,0) , (0,1) , (0,2) \\ (1,0) , (1,1) , (1,2) \\ (2,0) , (2,1) , (2,2) \end{Bmatrix}$$

We then interpret this set of ordered pairs of numbers as a set of points in a plane such that to each point there corresponds one ordered pair of numbers and vice versa. Now it is necessary for us to set up a model for geometric interpretation. To do this we intersect two number lines at the zero point, or origin of the graph, so that the lines are perpendicular to each other. Label the number lines as shown in the following figure by choosing X to denote the set of points on the horizontal line and Y to denote the set of points on the vertical line. Now we assign positive numbers to the right half line of X and negative numbers to the left half line of X. Similarly we

assign positive numbers to the upper half line of Y and negative numbers to its lower half line. The two number lines are called axes. We speak of the x axis when we refer to the horizontal number line and of the y axis when we refer to the vertical number line. We now have an interpretation such that every ordered pair of numbers labels a point in the plane determined by the X and Y axes.



Since we find each of the axes to represent an ordered set of points and both axes to cooperate in determining the plane, such a system is said to be a coordinate system and the plane determined by it is said to be a coordinate plane. Each ordered pair (x, y) tells you how to locate a point in the coordinate plane, by starting from the origin. (x, y) means: first move x units from (0, 0) along the x axis to the right or left (indicated by + or – preceding the first numeral of the pair); then move y units from that point parallel to the y axis (up or down as indicated by + or – preceding the second numeral of the pair).

3. Read and translate the following words. Make up the sentences with them.

To consider, a set, to be denoted by, notation, to observe, multiplication, commutative operation, a purpose, to wonder, to interpret, a plane, to correspond, vice versa, to intersect, an origin, to label, to assign, upper, an axis, to be determined by, to locate, to precede

4. Match the words on the left with their definition on the right.

1. a purpose 2. to consider	a) to spend time thinking about a possibility or making a decision;

3. a set 4. a notation 5. to observe 6. multiplication 7. to wonder 8. a plane 9. vice versa 10. to assign	b) to ask yourself questions or express a wish to know about something; c) flat, two-dimensional surface that extends infinitely far; d) a system of using symbols or signs as a form of communication, or a short written note; e) to decide a reason for something; f) the thing that you want to achieve, when you do something or make a lan; g) used to say that what you have just said is also true in the opposite order; h) to watch carefully the way something happens or the way someone does something, especially in order to learn more about it; i) a group of similar things that belong together in some way; j) one of the four basic operations of arithmetic, gives the result of combining groups of equal sizes.

6. Fill in the new vocabulary into the sentences:

1. I always keep a tool … in the back of my car.
2. Have you … what you'll do if you don't get the job?
3. The … of the research is to try to find out more about the causes of the disease.
4. We're … selling the house.
5. The doctor said that he hadn't seen this particular … of symptoms before.
6. He spent a year in the jungle, … how deforestation is affecting local tribes.
7. His only … in life seems to be to enjoy himself.

8. Don't make any decisions before you've … the situation.

9. We bought Charles and Mandy a … of cutlery as a wedding present.

10. The role of scientists is to … and describe the world, not to try to control it.

11. Children learn by … adults.

12. He's starting to … whether he did the right thing in accepting this job.

7. Answer the following questions.

1. What are the two number lines as we have used them for the coordinate systems called?

2. What is the horizontal number line often referred to?

3. What is the vertical number line often referred to?

4. Into how many parts do the two axes of the coordinate system divide the plane?

5. If both coordinates of a point are 0, where is the point located?

6. What does a coordinate of a point tell you?

7. What does each of the axes represent?

8**. Say if these statements are True (T) or False (F)**.

1. Each ordered pair (x, y) tells you how to locate every point in the plane.

2. We know each of the numbers of a pair to be either positive or negative.

3. The operation of forming the Cartesian product is commutative.

4. To every ordered pair of real numbers there correspond several points on the plane.

5. There is no one to one correspondence between real numbers and the points on a line.

9. Complete the following sentences with the verb "to be" in the correct tense.

1. Sir Isaac Newton ……. a very famous mathematician and physicist and his devotions to mathematics …… very important.

2. In the 1660s he …… in Grantham and his half–brothers and half–sisters …….. at home in Lincohnshire.

3. Mr. Forester …… …… to Paris for a long time.

4. He …… …… in Paris next week.

10. **Use the words in capitals to form a word that fits in the space:**

If you are setting up your vown business, it can be tempting to hire friends. After all, working with friends means fewer (1) … (ARGUE) and a much more (2) … (COMFORT) atmosphere in the workplace. Friends are also likely to put a longer hours, and want the business to be just as (3) … (SUCCESS) as you do. However, employing friends can also be rather (4) … (DANGER). What happens when one of your friends has a different idea about how you should run the business? Firing them will (5) … (CERTAIN) damage your friendship. Being an (6) … (EMPLOY) and a friend is not easy.

11. Choose the correct answer:

1. We landed at … Charles de Gaulle airport in Paris and were met by the ambassador.

a) a b) an c) - d) the

2. Tim's gone to … hospital to pick up the results of the test Mum had last week.

a) a b) an c) - d) the

3. A friend of mine works in a school for … deaf.

a) a b) an c) - d) the

4. Shall we have lunch at home or go to … Royal Oak and Castle?

a) a b) an c) - d) the

5. A hundred metres … not far from the beach.

a) are b) is c) has d) have

6. None of the plants … grown very much.

a) has been b) to become c) can d) have

7. Can you lend me … money?

a) a little b) a couple of c) a lot of d) a few

8. It is widely believed among scientists that we will … run out of natural resources.

a) short b) shorter c) shortly d) sportier

9. He treats his friends … dirt. I detest people behaving like that.

a) like b) as c) from d) a

10. Our local … closes at 6 p.m. on weekdays.

a) hairdresser b) hairdresser's c) hairdressers's d) hairdressers'

12. **Put the verbs into correct tense form in the Passive Voice**:

1. I hope you don't mind that you (not to invite).
2. I want you to write a letter. But the letter (to write) yesterday.
3. The palace (to build) by Sir Robert Flemming.
4. We (to invite) to their party on Saturday.
5. Is Marge popular? – Yes, she (to like) by everybody.
6. Was there any trouble at the demonstration? – Yes, about twenty people (to arrest).
7. We are going to do the work. But how it (to do)?
8. The job (not to offer) to Kate.
9. A decision (to postpone) until the next meeting.
10. There were some problems at first but they seem to (to solve).

13. **Correct the mistakes. There is a mistake in each sentence. Find it and correct it.**

1. I'm going to the Post Office for buy some stamps.
2. esterday was more hot than today.
3. Can I have a bread, please?
4. I've seen Jogn yesterday.
5. Where does live Anna's sister?
6. What means *whistle*?
7. Did she just bought a new car?
8. She's taller that her brother.

9. I always work hardly.

10. I’ve never drank champagne.

11. He doesn’t got any sisters.

12. Did you ever eat Italian food?

14. **Complete the sentences with the prepositions: *about, in, out of, by, on, for, to, from*.**

1. I’m reading a book … the history of Great Britain.
2. “Oliver Twister” is a book … Charles Dickens.
3. He drove … the garage and down the street.
4. Is it far … your house to the station?
5. Can I speak … you for a moment?
6. Is Mexici City the biggest City … the world?
7. Are you interested … politics?
8. She works … a big company.
9. Jane’s worried … her exam.
10. What’s … television today?

15. **Put the words in the correct order to make the sentences**:

1. up is because she tired she got early
2. many got you how cousins have?
3. exercise this do please quickly
4. Rome they have just have in arrived
5. exam students the yesterday a had difficult
6. well speak you very French
7. quickly road along man the walked the
8. by plane a have Shakespeare seen ever you?

16. **Fill in the gaps using the correct form of the verb in brackets**.

All calls …… (register) by the Help Desk staff.

Each call …… (evaluate) and then …… (allocate) to the relevant support group. If a visit …… (require), the user ……

(contact) by telephone, and an appointment ……(arrange). Most calls …… (deal with) within one working day. In the event of a major problem requiring the removal of a user's PC, a replacement can usually ……. (supply).

17. **Make the sentences passive. Use "by …" only if it is necessary to say who does/did the action**.

1. Charles Babbage designed a machine which became the basis for building today's computer in the early 1800s.

2. People submerged geometry in a sea of formulas and banished its spirit for more than 150 years.

3. People often appreciate analytical geometry as the logical basis for mechanics and physics.

4. Bill Gates founded Microsoft.

5. People call the part of the processor which controls data transfers between the various input and output devices the central processing unit (CPU).

6. You may use ten digits of the Hindu–Arabic system in various combinations. Thus we will use 1, 2 and 3 to write 123, 132, 213 and so on.

7. Mathematicians refer to a system with which one coordinates numbers and points as a coordinate system or frame of reference.

8. People similarly establish a correspondence between the algebraic and analytic properties of the equation f (x, y) = 0, and geometric properties of the associated curve.

9. In 1946 the University of Pensylvania built the first digital computer.

18. **Fill in the blanks with words derived from the words in bold:**

A new type of train may soon be in 1) … (operate) in Germany. So far tests have been 2) … (success) and it is hoped that in 10 year's time 3) … (commute) will be able to travel from Hamburg to Berlin in less than an hour. The Transrapid train is 4) … (actual) the world's lowest-flying aircraft. It has been designed to travel at up to 420 km per hour, and it has neither wheels nor a motor.

Instead of rails, a series of 5) … (magnet) units powers the train, allowing it to "fly" one santimetre above the tracks. Since it is suspended in the air, it can turn sharp corners at very high speeds without creating any 6) … (notice) disturbance inside the train. 7) … (environment) have serious 8) … (object) to the train, however, as it is 9) … (significant) noisier than normal trains. Nevertheless, it seems that the new train will soon be a popular 10) … (alternate) to travelling by aeroplane between cities in Germany.

UNIT 5

Mathematics at the intersection with other sciences

1. Read and translate the text.

SEQUENCES OBTAINED BY REPEATED MULTIPLICATION

A geometric progression (G.P.) is a sequence of numbers obtained by repeated multiplication. If *a*, *b* and *c* are three numbers in a G.P., there is $\frac{b}{a}=\frac{c}{b}$. Consider the first three terms of a geometric sequence. Let a represent the first term, and let *r* represent the common ratio.

First term : $a = ar^0$

Second term : $a.r^1$

Third term : $a.r.r = a.r^2$

For each term, the number of times r is used as a multiplier is 1 less than the number of the term. If the total number of terms in a G.P. are n then to find the n–th or last term, r will have to be used as a multiplier (n – 1) times. That is, $b_n = ar^{n-1}$. On the chessboard G.P. 1, 2, 4, 8, …, the value of a is 1 and r is 2. Since there are 64 squares on a chessboard, n = 64. Then $b_{64} = 1.2^{64-1}$ or accordingly, $b_n = 2^{63}$. You can readily find the value of 64 b by making use of logarithms; in standard form it is about 9.2×10^{18}. The chessboard G.P. is clearly understood to be an increasing progression. G.P. with a positive first term in which the common ratio is a number less than 1 is said to be a decreasing sequence. The common ratio may be negative. If this is the case and the terms are alternatively positive and negative as in +1, - 2, + 4, - 8, +16,… the sequence will move back and forth or oscillate from positive to negative, or from negative to positive. Such a G.P. is an oscillating sequence. The formula for the last term in a G.P. can, like any formula, be evaluated for any letter in it. If you wish to find the value of a, it will be convenient to apply the formula in the form $a=\frac{b_n}{r^{n-1}}$. If you want to find the value of *r* or of *n*, it will be well to

apply it in the form $r^{n-1} = \frac{b_n}{a}$. Logarithms may prove helpful, or else, you may be able to apply the laws of exponents.

2. Read and translate the following words. Make up sentences with them.

To obtain, sequence, multiplication, to consider, a represent, a multiplier, a term, a value, a square, according to, to increase, the common ratio, to decrease, to oscillate, to wish, convenient, to apply, helpful, a law, an exponent, to prove

3. Name in one word:

1. a person or organization at a meeting or in a law court ot parliament, you give their opinions and take action for them;

2. something happens more often, and so it affects more and more people or situations;

3. a place or way of doing something that is useful because it is quick, easy, and does not cause you any problems;

4. someone or something that gives you help or makes it easier for you to do something;

5. to show that something is definitely true, by providing facts or information;

6. an enumerated collection of objects in which repetitions are allowed and order matters;

7. the importance or worth of something for someone;

8. a regular quadrilateral, which means that it has four equal sides and four equal angles;

9. as stated by;

10. to move repeatedly from one position to another.

4. Give the synonyms to the following words:

- chain, succession, order –
- worth, usefulness, significance –
- on the report of, in accordance with, as stated by –
- to lessen, to grow less, to reduce –

- to want, to desire –

- suitable, appropriate, fit –

- to use, to put into practice –

- useful, advantageous, supportive –

5. Translate the sentences from Ukrainian into English using the new vocabulary:

1. Хто буде представляти Україну на наступному раунді мирних переговорів?

2. Серед дівчат-підлітків зростає кількість тих, хто палить.

3. Здається, бідність та бездомність знову зростають.

4. Кредитні карьки – це, мазут, найзручніший спосіб оплати квитків на концерти.

5. Я міг бі поїхати на поїзді, але на машині зручніше.

6. Якщо у вас проблеми з комп'ютером, вам може виявитися корисним керівництво з експлуатації.

7. Я б хотів довести, що він помиляється.

8. Я кажу правду, і можу вам це довести.

9. Його внесок мав незначну практичну цінність або взагалі не мав її.

10. Цу кімнат квадратної форми.

11. За словами Сари, все ще можна виправити.

12. Згідно з нашими записами, ви заборгували 130 доларів.

6. **Work in pairs to make a dialogue following the model**:

A: – What will you do if you draw a straight line? (to subtend the angle)

B: – If you draw a straight line, you will subtend the angle.

1. What will you do if you divide 25 by 4? (the remainder be equal to 1)

2. What will they do if they follow the rule? (to find the solution)

3. What will you need if you want to play back anything from your computer on a TV monitor? (to need a print–to–tape device)

4. What will your computer system have if it follows the American TV standard? (to have a vertical refresh rate at 60 KHz)

7. Complete the sentences with the words below. Are the sentences first (F) or zero (Z) conditional?

1. If you …… your screen for too long, you …… a headache.

2. If the market for portable computers ……., prices …… even more next year.

4. If the number n …… a composite number, the ring Z_n …… zero divisors.

5. If you …… your VDU in direct sunlight, it …… damaged.

6. If the field P …… in a greater field $\overline{P}$, the ring P [x] …… a subring of the ring $\overline{P}$[x].

7. If you …… pirated software, it is unlikely that you …… a problem with computer viruses.

grows	will get	do not copy	possess
will be	will be reduced	be	leave
look at	be contained	will have	

8. Complete these sentences.

1. a. If I have free time this weekend, … .

2. If I go on holiday this year, … .

3. If I carry on learning English, … .

4. If I feel tired this afternoon, … .

5. If I stay in my future job – teacher of maths, … .

9. Match the if – clauses to the main clauses to make complete sentences.

1. If you have a modem,	a. we will lose all our latest data.
2. If you never back up your hard disk,	b. you will miss important new products.
3. If the characteristic of a field is equal	c. the ring Z_n is a field.

to p, 4. If you never read computer maganizes, 5. If the number n is prime, 6. If the system crashes,	d. you will be able to access our bulletin board. e. you will probably lose some important files. f. then for any element a of the field we'll have the equality pa = 0.

10. Use the words in capitals to form a word that fits in the space:

Looking for a job is a job in itself. It takes (1) … (CARE) planning and a lot of thought. First of all, it is important to think about your (2) … (PERSON). You need to decide what kind of work appeals to you. What kind of (3) … (ACTIVE) do you enjoy doing? What type of position do you want? When you have answered all these questions, it is time to prepare your resume, cover letters and ask people you have worked for in the past to write letters of (4) … (RECOMMEND). Make sure that all of these documents look (5) … (PROFESSION). When you attend interviews, smile and speak (6) … (POLITE) to everyone you meet before and after your interview.

11. **Choose the correct word:**

1. Diane, you really should cut on sweets. You … fatter every time we meet.
   a) get b) have got c) are getting d) got
2. The yen … against the dollar.
   a) is falling b) falls c) has fallen d) fell
3. He's the most difficult customer I … with.
   a) has ever dealt b) ever dealed c) have ever dealt d) had ever dealt
4. Julia … her dinner by the time I returned home.
   a) had eaten b) has been eating c) has eaten d) eats
5. Last summer I … to the beach almost every day.
   a) went b) was going c) has been d) have been going
6. David … me to the station every morning.
   a) goes b) takes c) has d) makes

7. The purpose of running a business is to make a … .

a) money b) profit c) contribution d) service

8. He didn't feel like going to the party because he had a terrible … .

a) disease b) headache c) homesickness d) infection

9. Pre-heat the … to 200^0.

a) oven b) kitchen c) cuisine d) cook

10. You cant tell what someone is like just from their … .

a) character b) appearances c) personality d) looking

Text 2

1. Read and translate the text below.

MAPPINGS

Now, we shall concern ourselves with another of the important concepts of mathematics – the notion of a mapping. But first let us try an experiment designed to yield some information about our mental habits. Visualize your best friend. Of course, the image of a certain individual forms in your mind. But did you notice that accompanying this image is a name – the name of your friend? Not only did "see" your friend, but you also thought of his name. In fact, is it possible for you to visualize any individual without his name immediately emerging in your memory? Try! Furthermore, is it possible for you to think of the name of an individual, at the same time, visualizing that individual? The point of the proceeding experiment is to demonstrate that we habitually link together a person and his name; we seldom think of one without the other. Let us see what there is of mathematical value in the above observation. First, let us state the essentials of the situation. On the one hand, we have a set of persons; on the other hand, the set of names of these persons.

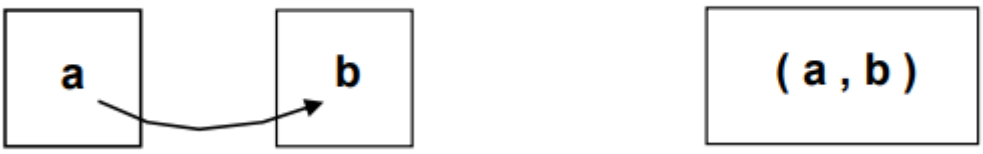
With each member of the first set we associate, in a natural way a member of the second set. It is in the process of associating members of one set with the members of another set that something new has been created. Let us analyse the situation mathematically. Denote the set of persons by "P" and the set of names by "N". We want to associate with each member of " P " an appropriately chosen

member of N; in fact, we want to create a mathematical object which will characterize this association of members of N with members P. We rely on one simple observation: there is no better way of indicating that two objects are linked together than by actually writing down the names of the objects, one after the other; i.e., we indicate that two objects are associated by pairing the objects. Now we see the importance of ordered pairs. The ordered pair (a, b) can be used to indicate that a and b are linked together.

Now we know how to characterize associating members of N with members of P: construct the subset P × N obtained by pairing with each person his name. The resulting set of ordered pairs express mathematically the associating process described above, since the person and the name that belong together appear in the same ordered pair.

Now a definition. Let "A" and "B" denote any non empty set. A subset of A × B, say μ, is said to be a mapping of A into B iff each member of A is a first term of exactly one ordered pair in μ . Moreover, we shall say that the mapping μ associates with a given member of A, say a, the member of B paired with a. Thus, iff (a, b) ∈ μ we shall say that "b" is associated with "a" under the mapping μ, b is also called the image of a under the mapping. Note that the subset P × N constructed above is a mapping of P into N. Thus our notion of a mapping of A into N permits us to characterize mathematically the intuitive idea of associating a member of B with each member of A.

intuitive idea mathematical representation



Under the intuitive idea, b is associated with a; this is represented by the mathematical assertion (a, b) ∈ μ. In short, the set μ characterizes the intuitive idea of associating a member of B with a member of A. If μ is a mapping of A into B such

that each member of B is a second term of at least one member of μ, then we shall say that μ is a mapping of A into B. Furthermore, if a mapping of A into B such that no member of B is a second term of two ordered pairs in the mapping, then we shall say that this subset of A × B is one to one mapping of A into B.

For example: { (1, 3), (2, 4), (3, 5), (4, 6) } is one to one mapping of {1, 2, 3, 4 } into {1, 2, 3, 4, 5, 6, 7 }. If μ is both a one to one mapping of A into B and a mapping of A onto B, then μ is said to be a one to one mapping of A onto B.

2. **Read and translate the following words/ Make up the sentences with them**.

Mapping, to concern, to yield, mental habits, to visualize, to notice, to emerge, memory, furthermore, to proceed, to link, observation, essential, to denote, appropriately, to rely on, empty, moreover, iff, to permit, mathematical assertion, at least

3. Match the words on the left with their definition on the right.

1. to nitice 2. mapping 3. to concern 4. to yeild 5. mental 6. a habit 7. to emerge 8. memory 9. to proceed 10. to link	a) to cause worry to someone**;** b) relating to the mind, or involving the process of thinking; c) to appear by coming out of something or out from behind something; d) to make a connection between two or more people, things, or ideas; e) to realize that something is there or that something is happening, when you see it, hear it, or feel it; f) the person's ability to encode, store, retain and subsequently recall information and past experiences in the human brain; g) to supply or produce something positive such as a profit, an amount of food or information; h) to continue as planned; i) the process of making a map;

	j) is a routine of behavior that is repeated regularly and tends to occur subconsciously.

4. Fill in the new vocabulary into the sentences:

1. I was driving home, when I … that the engine was making a strange noise.
2. The state of my father's health concerns us greatly.
3. The family has a history of … disorder.
4. It is … (that**)** our prices remain competitive.
5. Dominic took a huge slice of cake, hoping noone would … .
6. A doctor was asked about the … state of the prisoner.
7. His lawyers have decided not to … with the case.
8. The two events are … in my mined.
9. Water is … for/to living things.
10. The … system will not permit you to enter without the correct password.

5. **Answer the following questions**.

1. Which experiment in this text is designed to yield some information about our mental habit?
2. Does the image of a man usually accompany his name?
3. Does one necessarily visualize a man when hearing his name?
4. Why do we habitually link together a person and his name?
5. What do we show by pairing objects?
6. How do we characterize associating members of N with the members of B?
7. When do we say that μ is a mapping of A into B?
8. Under what condition is a subset of A × B said to be a mapping of A into B?
9. What do we mean by saying that the subset of A × B is a one to one mapping of A into B ?

6. The following words are taken from the text. In each case, say whether the paired words are similar (S) or opposite (O).

1. associating – visualizing
2. intuitive – mental
3. concept – idea
4. demonstrate – analyse
5. pair – accompany

7. Fill in the correct word derived from the words in bold:

Austranauts have to be physically and mentally ready for the stress and strain of a space mission. To prepare them, austranauts are given 1) … (intense) training, which includes years of classroom study on 2) … (vary) technical subjects, and working in a model spaceship where they can practice 3) … (complicate) fliht operations and becaome used to all the 4) … (equip) on board.

Apart from high 5) … (intelligent), good qualifications and an excellent level of fitness, austranauts must have a strong character. They also have to be very 6) … (courage) in order to accept the high risks involved.

8. Choose the correct answer:

1. There is a wooden … on one side of the garden and a hedge on the other.

a) wall b) fence c) end d) bush

2. I came across this antique clock quite by … .

a) sight b) chance c) luck d) heart

3. We apologize for the … in the delivery of the goods.

a) failure b) lateness c) absence d) delay

4. The jumper was very cheap. It was a real … .

a) sale b) price c) bargain d) profit

5. The post office is … on the corner at the end of the road.

a) put b) placed c) stood d) situated

6. If you don't … theses flowers they'll fade.

a) dampen b) wet c) water d) moisten

7. Her parents wear really … clothes.

a) historical b) old-fashioned c) old age d) elderly

8. The airplanes take off … minutes.

a) every b) every few c) some d) many

9. I wouldn't want … of my parents know I have a boyfriend.

a) nobody b) any c) none d) either

10. The doctor says he has to walk … .

a) a lot b) a few c) little d) at all

Test 3

1. Read and translate the text below.

MULTIMEDIA

'Welcome to the world of highend multimedia. Multimedia is not a new phenomenon, although it is new to business computing. We live in a multimedia world. At home, we experience a variety of media through our television: full motion video, still images, graphics, sound and animation. The situation described above is not quite here yet, but most of the pieces already exist to make this scenario become a reality using a network RS/6000 or other high-power workstation.

A manager creates a detailed business presentation involving text, graphics, digitized photographic still images and tables of spreadsheet data all combined in a single compound document. Before sending the document across the network to a colleague, the manager picks up the microphone and attaches an audio note to one of the tables, reminding the colleague about something unusual or potentially confusing in the accompanying figures'.

2. **Read and translate the following words. Make up the sentences with them**.

To experience, a variety, an image, to describe, to exist, a still image, data, to combine, compound, a network, a colleague, to attach, to remind, to confuse

3. Name in one word:

1. something that happens to you or something that you do, especially something unusual or important that you remember and learn from;

2. to be something that is really present or living;

3. to make someone remember something they must do or something they need to know;

4. to wrongly think that one person or thing is someone or something else;

5. a number of different types of things, especially ones in the same general category;

6. to say or write what someone or something is like;

7. information, especially facts or numbers, collected to be examined and considered and used to help decision-making, or information in an electronic form that can be stored and used by a computer;

8. something consisting of two or more different parts;

9. a number of computers that are connected together so that they can share information;

10. to fasten, join, or connect something.

4. Give the synonyms to the following words**:**

- variation, diversification, difference –
- to give details of, to put into words, to report –
- basic facts, statistics, information –
- complex, not simple –
- a workmate, a co-worker, a collaborator –
- to fasten, to fix, to join, to connect –
- to mix up, to make unclear, to disorient -

5. Translate the sentences from Ukrainian into English:

1. Думаєте, привиди справді існують?

2. Земля існує більше чотирьох тисяч мільйонів років.

3. Політики поводяться так, ніби бідності не існує.

4. Я повинен сплатити рахунок на гах – я залишу його тут, щоб наадати собі.

5. Я завжди плутаю Енн з її сестрою – вони виглядають такими схожими.

6. Плануючи їжу, потрібно думати про різноманітність та смак, а також про харчову цінність.

7. Не могли б Ви описати зловмисника?

8. Він детально описав картину.

9. Ці дані збирали різні дослідники.

10. Ми могли б зменшити наші витрати, розробивши більш ефективну дистрибуційну мережу.

11. Я прикріпив фото до моєї анкети.

12. Я додаю копію нашого останнього звіту.

6. Rewrite the sentences using an *–ing / –ed* phrases.

1. ‘A plane which (that) was carrying passengers crashed into the sea yesterday.

2. None of the people who were invited to the party can come.

3. When I was walking home, there was a man who followed me.

4. All the letters that were posted yesterday should arrive tomorrow’.

7. Change the relative clauses to participle phrases.

1. ‘Any expression like x + 5 or 2x – 3 **that** contains two or more terms may be called a polynomial meaning an expression with many parts.

2. An axiom is a statement **that** is generally accepted as true without proof.

3. Most of the problems **that** concern digits (0 through 9) are based on the fundamental principle of our decimal system: that is, the position of a digit with respect to the decimal points indicates the value **which** is represented by it.

4. Such quantities as 5, x, a – 1 and $n^2 + 1$ are prime, since they are not divisible by any quantities **that** is except themselves and 1.

5. The number $\frac{c}{d}$ or $\frac{c}{2r}$, **which** is the same for all circles, is designated by π.

6. A diametre is a chord **which** passes through the centre of the circle.

7. A circle is a set of points in a plane each of which is equidistant, that is the same distance from some given point in the plane **which** is called the centre.

8. No matter how the problems which deal with the division of polynomials are stated they should always be copied in the form **that** is used for long division in arithmetic.

9. Points A and B **that** represent the opposite points of a circle are equidistant from the centre'.

8. Change the participle phrases to relative clauses.

1. 'The technician goes to a high power workstation *attached* to a network and calls up the information on the part and the replacement procedure.

2. An image of the part **seated** in the engine appears.

3. Instructions are first written in one of the high–level languages, e.g. FORTRAN, COBOL, ALGOL, PL/I, PASCAL, BASIC, or C, **depending** on the type of problem to be solved.

4. Today the possibility of hackers **breaking** into corporate and government computers poses a constant threat to society.

5. A program **written** in one of the languages is often called a source program and it can not be directly processed by the computer until it has been compiled.

6. The compiler is a system program **written** in any language, but the computer's operating system is a true system program controlling the central processing unit (CPU), the input, the output and the secondary memory devices.

7. Another system program is the linkage editor **fetching** required system routines and **linking** them to the object module.

8. These features **combined** together provide a very powerful tool for the programmer.

9. The program **produced** after the source program has been converted into machine code is referred to an object program or object module'.

9. Change the following sentences according to the model.

i A: – I have got a book which deals with computers.

B: – I've got a book dealing with computers.

1. 'I know the man who teaches you English.

2. Give me the journal which lies on the table.

3. I must see the scientists who work in this lab.

4. The letters which name the angles are A, B, C.

ii A: – The material which is used in the article is true.

B: – The material used in the article is true.

1. The most prevalent calculator in the United States is the slide rule, which is based on the principle of logarithms.

2. One of the original calculators was undoubtedly a version of the Japanese abacus, which is still in use today.

3. Most calculators are based on the fundamental mathematical principle which is called the binary number system.

4. The calculators which were traced back to the Tigris Euphrates Valley 5000 years ago are original'.

10. Complete these sentences using the verbs in the box.

stand	live	cry	steal	read	offer
knock	make	blow	call	wait	lead

1. 'Somebody …… Jack phoned while you were out.

2. When I entered the waiting room there was nobody …… except for a young man …… by the window …… a magazine.

3. A few days after the interview, I received a letter …… me the job.

4. Sometimes life must be very unpleasant for people …… near airports.

5. The paintings …… from the museum haven't been found yet.

6. Did you hear about the boy …… down on his way to school this morning?

7. Most of the suggestions …… at the meeting were not very practical.

8. At the end of the street there is a path …… to the river.

9. I was woken up by the baby ……

10. There was a tree …… down in the storm last night'.

11. **Fill in the correct word derived from the words in bold**.

For an 1) … (**enjoy**) fun-filled holiday, Thailand is one of your most exciting options. Thailand has something for everyone.

Taste delicious 2) … (**spice**) food in 3) … (**live**) restaurants or experience the 4) … (**colour**) nightlife of Bangkok, the capital city. Here, you can choose from a variety of entertainment – from 5) … (**tradition**) dancing to modern musical shows. You will certainly enjoy the 6) … (**peace**) green valleys and 7) … (**impress**) temples.

If you are looking for a more active holiday, you can hike through Thailand's 8) … (**mountain**) areas and rollinh hills. Perhaps visiting a 9) … (**sand**) beach and swimming in refreshing waters will give you new energy.

Between sampling 10) … (**taste**) Thai cuisine, seeing new sights and being entertained, you won't have a dull moment.

12. Choose the correct answer:

1. … most world maps are out of date now, due to the political events.

a) A b) An c) - d) The

2. … Chicago Bulls, from the USA, are one of the best-known basketball teams.

a) A b) An c) - d) The

3. Middle-aged people tend to criticize … young for their disrespectful attitude.

a) a b) an c) - d) the

4. Prince Peter visited … Royal Albert Hall today.

a) a b) an c) - d) the

5. Jane likes … your paintings.

a) a couple of b) no c) too much d) a little

6. … he didn't know what his relations looked like they sent him a photo.

a) Like b) As c) If d) Only if

7. A number of police officers … here with dogs.

a) work b) works c) have been worked d) has been worked

8. The students borrowed each … notes before the exam.

a) other b) others' c) other's d) others's

9. I could hardly keep away. It is … film ever made by this director.

a) the most duller b) the dullest c) the most dull d) a more duller

10. 20 years … a long time to spend in prison for the theft.

a) is b) are c) has d) have

Text 4

1. Pre – reading task Work in pairs. Choose the best definition of matrix.

1. An array of numbers arranged in rows and columns.

2. A set of quantities (called elements) arranged in a rectangular array, with certain rules governing their combination.

3. An n–dimensional real vector space domaining a set of real numbers.

2. Read and translate the text below.

MATRICES

Although the idea of a matrix was implicit in the quaternion (4–tuples) of N.Hamilton and also in the "extended magnitude" (n–tuples) of H.Grassmann, the credit for inventing matrices is usually given to Cayley with a date of 1857, even though Hamilton obtained one of two isolated results in 1852. Cayley said that he got the idea of a matrix " either directly from that of a determinant, or as a convenient mode of expression of the equations x' = ax + by, y' = cx + dy". He represented this transformation and developed an algebra of matrices by observing properties of transformations on linear equations:

$$\begin{cases} x' = ax + by \\ y' = cx + dy \end{cases} \rightarrow \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$

Cayley also showed that a quaternion could be represented in matrix form as shown above where a, b, c, d are suitable complex numbers. For example, if we let the quaternion units 1, i, j, k be represented by

$$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \begin{bmatrix} i & 0 \\ 0 & i \end{bmatrix}, \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix} \text{ and } \begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$$

the quaternion 4 + 5i + 6j + 7k can be written as shown below:

$$\begin{bmatrix} 4+5i & 6+7i \\ -6+7i & 4-5i \end{bmatrix}$$

This led P.G.Tait, a disciple of Hamilton, to conclude erroneously that Cayley had used quaternion as his motivation for matrices. It was shown by Hamilton in his theory of quaternion that one could have a logical system in which the multiplication is not commutative. This result was undoubtedly of great help to Cayley in working out his matrix calculus because matrix multiplication also is non–commutative. In 1925 Heisenberg discovered that the algebra of matrices is just right for the non–commutative maths describing phenomena in quantum mechanics.

Cayley's theory of matrices grew out of his interest in linear transformations and algebraic invariants, an interest he shared with J.J.Silvester. In collaboration with J.J.Silvester, Cayley began the work on the theory of algebraic invariants which had been in the air for some time and which, like matrices, received some of its motivation from determinants. They investigated algebraic expressions that remained invariants (unchanged except, possibly, for a constant factor) when the variables were transformed by substitutions representing translations, rotations, dilatations ("stretching" from the origin), reflections about an axis, and so forth.

There are three fundamental operations in matrix algebra: addition, multiplication and transposition, the last not occuring in ordinary algebra. The law of multiplication of matrices which Cayley invented and his successors have approved, takes its rise in the theory of linear transformations. Linear combinations of matrices with scalar coefficients obey the rules of ordinary algebra. A transposition is a permutation which interchanges two numbers and leaves the other fixed, or in other words: the formal operation leading from x to x' and also that leading from x' to x is called transposition. A matrix of m rows and n columns has rank r, when not all its minor determinants of order r vanish, while of order $r + 1$ do. A matrix and its transposition have the same rank. The rank of a square matrix is the greatest number of its rows or columns which are linearly independent.

Today, matrix theory is usually considered as the main subject of linear algebra, and it is a mathematical tool of the social scientist, geneticist, statistician, engineer and physical scientist.

3. **Read and translate the following words. Make up the sentences with them**:

Matrix, implicit, a tuple, extended, to invent, a determinant, equation, a quaterion, suitable, a disciple, to conclude, erroneously, commutative, undoubtedly, calculus, to share, collaboratopn, to remain, except, constant, a variable, substitution, a rotation, dilation, axis, to occur, a successor, to approve, to obey, permutation, to interchange, to row, to vanish, independent

4. **Match the words on the left with their definition on the right.**

1. to invent 2. suitable 3. to share 4. to remain 5. except 6. independent 7. matrix 8. to implicit 9. a tuple 10. a quaternion	a) if two or more people do it, they all use it together; b) suggested but not communicated directly; c) not including the person or thing that you have mentioned; d) the quotient of two directed lines in a three-dimentional space, or, equivalently, as the quotient of two vectors; e) something or someone that is still exists or is still available after everything else has gone or has been used; f) to think of an idea for a new product, machine etc for the first time, and design it and make it; g) a finite ordered list (sequence) of elements; h) a country that is not rulled by another country and has its own government; a person that can make their own decisions, organize their own life, and pay for the things they need, without help or advice from other people; i) a set of numbers arranged in rows and columns so as

	to form a rectangular array; j) the right kind of thing or person for a purpose, job or situation;

5. **Fill in the new vocabulary into the sentences:**

1. Alexander Graham Bell … the telephone.
2. I still haven't found a … job.
3. We don't have enough books, so some of you will have to … .
4. Television was … in 1920s.
5. You must wear something … - preferably black.
6. I have my own room but we … the kitchen and bathroom.
7. The house would be … for a large family.
8. Not much of the house … after the fire.
9. Everyone's going … Donald.
10. I've become much more … since I started living on my own.
11. We have dealt with most things, but a few small problems … .
12. 'Cosmopolitan' is a magazine for young … professional women.
13. He interpreted her comments as an … criticism of the government.
14. Carla had just started her first job, and she enjoyed being financially … .

6. **Are these statements true (T) or false (F)? Correct the false statements.**

1. Cayley was the first inventor of matrices.
2. Cayley's idea of a matrix comes from Hamilton's theory of quaternion.
3. Properties of transformations on linear equations serve as the basis of Cayley's theory of matrices.
4. The law of multiplication of matrices does not relate to the theory of linear transformations.

7. Answer the following questions.

1. Who was the first to create a matrix? When was this?
2. Did anyone obtain the idea of a matrix before him?

3. What did Hamilton show in his theory of quaternion?

4. Why did Hamilton's theory of quaternion help Cayley to work his out matrix theory?

5. What did Heisenberg discover in 1925?

6. Who did Cayley collaborate with on the theory of algebraic invariants? What did they investigate?

7. What are three fundamental operations in matrix algebra?

8. Write the plural forms of these nouns:

Analysis, hypothesis, axis, index, basis, parenthesis, crisis, synthesis, directrix, thesis, emphasis, vertex

9. **Fill in the gaps using the words above**.

a. Points A, B, C are called the …… of triangle ABC.

b. In $b^{3n} + x$, 3 and x are …… .

c. Rates of work are calculated on a monthly …… .

d. The vertical line is named the y …… .

e. Nowadays, some schools put great…… on foreign language study.

f. It's always not easy to prove a …… .

10. Match these terms with their definitions.

1. projective geometry	a) a plural of radius. A straight line joining the centre of a circle or sphere to any point on the circumference or surface
2. a segment	b) a transformation consisting of rotations and translations which leaves a given arrangement unchanged
3. radii	c) the branch of geometry concerned with the properties of solids that are invariant under projection and section
4. a rigid motion	d) the formation of conclusions from incomplete evidence; guess

5. mapping — e) logical sequence, cohesion, or connection

6. a conjecture — f) an entity, quantity, etc., that is unaltered by a particular transformation of coordinates

7. an invariant — g) a topological structure which prevents the object from being continuously shrunk to a point

8. continuity — h) a branch of geometry describing the properties of a figure that are unaffected by continuous distortion, such as stretching or knotting

9. topology — j) a model of the extended complex plane, the complex plane plus a point at infinity

10. a hole in a mathematical object — k) a part of a line or curve between two points

11. Riemann sphere — l) a ring-shaped surface generated by rotating a circle about a coplanar line that does not intersect the circle

12. manifold — m) representing or transforming (a function, figure, set, etc.)

13. torus — n) a topological space having specific properties

14. helix — o) a curve that lies on a cylinder or cone, at a constant angle to the line segments making up the surface; spiral

11. Make up ten sentences using these word combinations:

To worry about something (somebody), to hand something to somebody, to deal with somebody, to be (to get) angry with somebody, to reach for something, to be in hospital, to take somebody to hospi tal, to injure somebody with something

12. Give Ukrainian equivalents for these word combinations:

a) to manage to do something, to manage a child;

b) to want something badly, to hurt somebody badly, badly injured;

c) to be (to come) back, to bring back, to take back, to send back, to give back, to throw back, to pay back;

d) a smart deal, a smart answer, a smart person, a smart dress;

e) to miss the train, to miss the opportunity, to miss classes, to miss the ball, to be missing

13. Translate these sentences into English using word combinations given in exercise 12.

а) 1. Я сподіваюся, ми зможемо добратися туди до темряви. 2. Я думаю, що зумію дістати квитки без вашої допомоги.

б) 1. Наша команда дуже хотіла виграти, і вона зуміла домогтися перемоги (виграла). 2. Хоча він дуже сильно забив ногу під час матчу, він продовжував грати.

в) 1. Вам слід повернутися до цього питання ще раз. 2. Вас просили повернути книгу якомога швидше. 3. Надішліть, будь ласка, документи назад в п'ятницю. 4. Вам доведеться повернути статтю в бібліотеку, вона всім дуже потрібна. 5. Він повернеться наступного тижня.

г) 1. Она дуже елегантна. 2. У нього завжди знайдеться дотепна відповідь. 3. Він дуже спритна (хитра) людина. 4. Мері – дуже розумна дівчинка.

д) 1. Боюся, ми запізнилися на поїзд. 2. Цікаво, чому вона пропустила заняття. 3. Не розумію, чому вони упустили можливість з'їздити до Києва. Це була така цікава подорож.

14. **Choose the correct answer**:

1. 'I'm really tired of travelling so much'. 'I thought you … a bit quiet'.

a) were seeming b) have seemed c) have been seeming d) seemed

2. Our next door neighbor … his car every Sunday.

a) is washing b) washes c) has washed d) is wash

3. I … to all the local newspapers and TV stations to complain.

a) already write b) already writing

c) have already written d) have already been writing

4. Dan … in the living room while we redecorate his bedroom.

a) sleeps b) is sleeping c) has slept d) does sleep

5. Mac Donald … in New Zealand for seventeen years before he decided to go back to Scotland.

a) lives b) had lived c) has been living d) is living

6. Hurry up, or we'll … the bus.

a) avoid b) drop c) miss d) lose

7. A retired person is paid a … .

a) grant b) pension c) rent d) scholarship

8. Her mother sent her to bed because she had a high … .

a) cough b) fever c) temperature d) illness

9. Are you going to have a … party tomorrow night?

a) dinner b) lunch c) evening d) noon

10. I was born in Scotland and … by my grandparents.

a) grew up b) rose c) brought up d) looked

15. **Read the text and fill in the gaps with the following words:**

squashed, stumbled across, removed, conjecture, continuous, rigid, in extremely convoluted ways, flexible, deceptive, ostensibly

The main ingredients of Euclid's geometry – lines, angles, circles, squares and so on – are all related to measurement.

Line segments have lengths, angles are a definite size with 90' differing in important ways from 91' or 89', circles are defined in terms of their radii, squares have sides of a given length.

The hidden ingredient that makes all of Euclid's geometry work is length, a metric quantity, one which is unchanged by rigid motions and defines Euclid's equivalent concept to motion, congruence.

When mathematicians first 1) _____ other types of geometry, these too were metric. In non-Euclidean geometry, lengths and angles are defined; they just

have different properties from lengths and angles in Euclidean plane. The arrival of projective geometry changed this: projective transformations can change lengths, and they can change angles.

Euclidean geometry and the two main kinds of nonEuclidean geometry are 2) _____. Projective geometry is more 3)_____, but even here subtler invariants exist, and in Klein's picture what defines a geometry is a group of transformations and the corresponding invariants.

As the 19th century approached its end, mathematicians began to develop an even more flexible kind of geometry; so flexible, in fact, that it is often characterized as rubber-sheet geometry. More properly known as topology, this is the geometry of shapes that can be deformed or distorted 4) _____.

Lines can bend, shrink or stretch; circles can be 5)_____ so that they turn into triangles or squares. All that matters here is continuity. The transformations allowed in topology are required to be 6)_____ in the sense of analysis; roughly speaking, this means that if two points start sufficiently close together, they end up close together – hence the 'rubber sheet ' image. There is still a hint of metric thinking here: close together' is a metric concept.

But by early 20th century, even this hint had been 7)_____ and topological transformations took on a life of their own. Topology quickly increases its status, until it occupied center stage in mathematics – even though to begin with it seemed very strange, and virtually content-free. With transformations that flexible, what could be invariant? The answer, it turned out, was quite a lot. But the type of invariant that began to be uncovered was like nothing ever before considered in geometry. Connectivity – how many pieces does this thing have? Holes – is it all one lump, or are there tunnels through it? Knots – how is it tangled up, and can you undo the tangles?

To a topologist, a doughnut and a coffee- cup are identical (but a doughnut and a tumbler are not); however both are different from a round ball. An overhand knot is different from a figure-eight knot, but proving this fact required a whole new kind of

machinery, and for a long time no one could prove that any knots existed at all. It seems remarkable that anything so diffuse and plain weird could have any importance at all. But all appearances are 8) _____.

Continuity is one of the basic aspects of the natural world, and any deep study of continuity leads to topology. And our understanding of the phenomenon of chaos rests on topology. The main practical consumers of topology are quantum field theorists.

Another application of topological ideas occurs in molecular biology, where describing and analyzing twists and turns of DNA molecule requires topological concepts.

Topology is a rigorous study of qualitative geometric features, as opposed to quantitative one like lengths. A key step was the discovery of connections between complex analysis and the geometry of surfaces, and the innovator was Riemann.

The obvious way to think of a complex function f is to interpret it as a mapping from one complex plane to another. The basic formula w=f(z) for such a function tells us to take any complex number z, apply f to it and deduce another complex number w associated with z. Geometrically, z belongs to the complex plane, and w belongs to what is in effect a second, independent copy of the complex plane. Riemann found it useful to include infinity among the complex numbers, and he found a beautiful geometric way to do this. Place a unit sphere so that it sits on top of the complex plane. Now associate points in the plane with points on the sphere by stereographic projection. This construction is called Riemann sphere.

The complex analysis found that, topologically, every Riemann surface is either a sphere, or a torus, with two holes, or a torus with three holes etc. The number of holes, g, is known as the genus of the surface, and it is the same g that occurs in the generalization of Euler's formula to surfaces.

The natural step after surfaces – is three dimensions. Poincare posed a question, later reinterpreted as the Poincare 9) _____ - if a three-dimensional manifold (without boundary, of finite extent, and so on) has the property that any

loop in it can be shrunk to a point, then that manifold must be topologically equivalent to the 3-sphere (a natural three-dimensional analogue of a sphere). In 2002 Grigori Perelman caused a sensation by placing several papers on arXiv, the website for physics and math research. 10)_____these papers were about the Ricci flow, but it became clear that if the work was correct, it would imply the geometrization conjecture, hence that of Poincare.

(an extract from the book The story of mathematics by Ian Stewart)

16. Choose the best explanation for each of these words and phrases from the text:

1. subtler

a) less obvious or comprehensible b) thinner

2. distorted

a) twisted b)amplified

3. took on a life of their own

a) acquired a life of their own b) disappeared

4) virtually content-free

a) practically meaningless b) unreal

5. tangled up

a) knotted or coiled together b) ensnared or trapped

17. Mark these statements T (true) or F (false) according to the information in the text. Find the part of the text that gives the correct information.

1. Non-Euclidean geometry is metric.
2. Topology is virtually Projective geometry.
3. The study of continuity leads to Topology.
4. Hole is the concept in Topology.
5. The genus of a surface is in fact a number of holes on it.

18. Look quickly at the text and answer these questions.

1. What is Topology?
2. What are the applications of Topology?

3. What are the basic concepts of Topology?

4. Who managed to solve the Poincare conjecture? Give the details.

5. What is Riemann surface?

19. Match these terms with their definitions.

1) face	a) a solid figure having four plane faces
2) vertex (pl vertices)	b) the point opposite the base of a figure
3) edge	c) a solid figure having twelve plane faces
4) tetrahedron	d) a solid figure consisting of four or more plane faces (all polygons), pairs of which meet along an edge, three or more edges meeting at a vertex
5) octahedron	e) a solid figure having eight plane faces
6) dodecahedron	f) a joint made by beveling each of two parts to be joined, usually at a 45° angle, to form a corner, usually a 90° angle
7) a mitred corner	g) a line along which two faces or surfaces of a solid meet
8) polyhedron	h) any one of the plane surfaces of a solid figure

UNIT 6

Outstanding figures of mathematics

I. Read and translate the text:

Mathematics – the Language of Science

One of the foremost reasons given for the study of mathematics is that mathematics is the language of science. This does not mean that mathematics is useful only to those who specialize in science. It implies that even a layman must know something about the foundations, the scope and the basic role played by mathematics in our scientific age.

The language of mathematics consists mostly of signs and symbols, and, in a sense, is an unspoken language. There can be no more universal or simpler language. It is the same throughout the civilized world, though the people of each country translate it into their own particular language. For instance, the symbol 5 means the same to a person in England, Spain, Italy or any other country, but in each country it may be called by a different spoken word. Some of the best known symbols of mathematics are the numerals 1, 2, 3, 4, 5, 6, 7, 8, 9, 0 and the signs of addition (+), subtraction (-), multiplication (×), division (:), equality (=) and the letters of the alphabets: Greek, Latin, Gothic and Hebrew (rather rarely).

Symbolic language is one of the basic characteristics of modern mathematics for it determines its true aspect. With the aid of symbolism, mathematicians can make transitions in reasoning almost mechanically by the eye and leave their minds free to grasp the fundamental ideas of the subject matter. Just as music uses symbolism for the representation and communication of sounds, so mathematics expresses quantitative relations and spatial forms symbolically. Unlike the common language, which is the product of custom, as well as social and political movements, the language of mathematics is carefully, purposefully and often ingeniously designed. By virtue of its compactness, it permits a mathematician to work with ideas which, when expressed in terms of common language, are unmanageable. This compactness makes for efficiency of thought.

Mathematics is a special kind of language. The language so perfect and abstract that, possibly, it may be understood by intelligent creatures throughout the universe, no matter how different their organs of sense and perception may be. The grammar of the language – its proper usage – is determined by the rules of logic. Its vocabulary consists of symbols, such as numerals for numbers, letters for unknown numbers, equations for relationships between numbers and many other symbols, including the ones used in higher mathematics.

All of these symbols are tremendously helpful to the scientist because they serve to cut-short his thinking.

Albert Einstein wrote: "What distinguishes the language of science from language as we ordinarily understand the word? How is it that scientific language is international? The supernational character of scientific concepts and scientific language is due to the fact that they are set up by the best brains of all countries and all times."

2. **Read andtranslate the following words/ Make upmthe sentences with them.**

Foremost, a reason, useful, a layman, a foundation, the scope, to consist of, a sign, throughout, a particular language, for instance, a numeral, addition, subtraction, multiplication, division, equality, to determine, aid, to leave, to grasp, a sound, to express, a quantative relation, a spatial form, a custom, a movement, careful, purposefully, ingeniously, virtur, to permit, efficiency, perfect, an intelligent creature, universe, organs of sense and perception, vocabulary, tremendous, to distinguish, due to

3. Name in one word:

1. what makes something happen, or what makes someone do something;
2. to go away from a room or building;
3. something that you hear;
4. someone who tries not to make mistakes, and tries to do everything correctly;

5. someone or something that is good in every way and could not be any better;

6. most important or best; leading;

7. someone who is not trained in or does not have a detailed knowledge of a particular subject;

8. an idea or fact that something is based on;

9. for example;

10. help or support.

4. Give the synonyms to the following words:

- leading, top, first –
- cause, motive –
- to say indirectly, to hint –
- specific, distinct, precise –
- to settle, to decide –
- ceremony, ritual, procedure –
- goodness, rightneousness, good point, merit, advantage –
- to allow, to let –
- well-orderedness, productivity, effectiveness –
- word stock, lexicon, lexis –

5. Translate the sentences from Ukrainian into English:

1. Чому Майк не прийшов на вечірку, - Не знаю, але причина має бути.

2. Причиною підвищення цін стало подорожчання матеріалів.

3. Телефон адзвонив саме тоді, коли я виходив з дому.

4. Перш ніж виїодити х дому, переконайтесь, що всі вікна зачинені.

5. Єдиним звуком у будинку було тікання годинника.

6. Телевізор зламаний – ви можете бачити зображення, але звуку немає.

7. Вони були обережні, щоб нічого не чіати, поки е приїде поліція.

8. Це стара машина, але вона в ідеальному стані.

9. Це один з найвидатніших центрів мистецтва країни.

10. Вона є одним з найвидатніших фахівців з дитячої психології.

11. Однією з основ демократії є справедливий суд.

12. Чоловік на вулиці побачив, що у неї біда, і прийшов їй на допомогу.

6. **Match the following**:

1. foremost	a) давньоєврейська мова
2. Gothic	b) головний
3. Hebrew	c) готська мова
4. aid	d) перехід
5. transition	e) на різницю від
6. reasoning	f) завдяки
7. spatial	g) геніально
8. unlike	h) лаконічно
9. common	i) просторовий
10. by virtue of	j) звичайний
11. ingeniously	k) прискорювати мислення
12. Compactness	l) непрофесіонал
13. efficiency	m) сприйняття
14. to cut-short thinking	n) точність
15. Perception	o) мислення
16. Layman	p) допомога

7. Answer the following questions.

1. What does the language of mathematics consist of?

2. Why is mathematics called a universal language?

3. What are the best known mathematical symbols?

4. How can mathematics be likened to music?

5. What is the most characteristic feature of the language of mathematics?

6. What are the grammar and the vocabulary of mathematics as the language of science?

7. How do mathematical symbols help the scientists in their research work?

8. How did Einstein explain the international, or supernational, character of the language of science?

8. **Say the same in a different way using conditional sentences. See the model.**

Model:

If it were not for the works of the preceding scholars, the scientists of the following generations would not have made their discoveries.

But for the works of the preceding scholars, the scientists of the following generations would not have made their discoveries.

Якщо б не праці вчених минулих часів, сучасні вчені не змогли б зробити свої відкриття.

1. *If it were not for* a trifling error, the experiment might have been a success.

2. *But for* Babylonian and Mesopotamian mathematicians, Alexandrian scholars would not have achieved such remarkable results.

3. *If it were not for* the unreliable equipment, there would be fewer mistakes in print.

4. *But for* the absurdity of the solution, we might not have noticed the error.

5. *If it were not for* the discovery of logarithms, the scholars of the 18th century would not have been able to make such great and successful advances.

6. *But for* Kepler's enthusiasm, the tables of logarithms would not have so rapidly spread.

7. *But for* mathematics, the present day achievements in science and technology would have been impossible.

8. *If it were not for* the greatest discoveries of world-famous scholars, our life would not be so comfortable as it is now.

9. *But for* the computer, many sciences would not have advanced so far.

9. Open the brackets. Use the right type of conditionals:

1. I would have called you if I (know) you were at home.
2. It may be possible, if both parties (desire) it, to reduce the time scale.
3. Shall we start the decorating at the weekend if we (have) no other plans?
4. If you (spill) even something as innocuous as water on this fabric, it (stain).
5. When you (press) the 'record' button, the green ligt (come) on.
6. If the museum (charge) for entry, a lot of people (not be able to) use it.
7. You (be) unhappy with any of our operatives, we (replace) the immediately.
8. If the form correctly (complete), the transfer (take) only two days.
9. The organizers would respond positively to proposal if they (be) submitted by 10th June.
10. If I (be) you, I should try to see a consultant as soon as possible.
11. If he (wait) a bit longer, we would have given him the results.
12. The King of Belgium didn't attend the royal wedding. If he (be) there, he (witness) a marvelous spectacle.
13. If the company didn't want to continue sponsoring us in the future, they (not renew) our contract las week, would they?
14. If the authority (build) new hoes as planned, we (have) fewer homeless people on our streets today.

10. **Identify the non-finite forms of the verb in the following text: *the gerund, the participle or the infinitive***.

The Value of Solving Problems in Mathematics

There is much *thinking and reasoning* in mathematics. The students master the subject matter not only by *reading* and *learning*, but by *proving* theorems and *solving* problems. The problems, therefore, are an important part of *teaching*, because they make the students *discuss* and *reason* and *polish up* their own knowledge.

To understand how experimental knowledge is matched with theory and how new results are obtained, the students need *to do* their own *reasoning* and *thinking*. Of course, it is easier for both teacher and student if the text states all the results and outlines all the *reasoning*; but it is hard *to remember* such teaching for long, and harder still *to get* a good *understanding* of science from it.

Solving problems, you do your own *thinking*, and for this reason, problems form a very important part of *teaching*.

Some questions *raised* by the problems obviously do not have a single, unique or completely correct answer. More than that, the answers to them may be sometimes *misleading*, *demanding* more *reasoning* and further *proving*. Yet, *thinking* your way through them and *making* your own choice and *discussing* other choices are part of a good education in science and a good method of *teaching.*

11. Write suitable forms of the words in brackets, putting verbs into an-ing or infinitive form.

1. For evil (succeed) it is only necessary that the good do nothing.
2. Sylvia rang her doctor (make) an appointment.
3. We got there only (find) that the concert had been canceled.
4. It's strange that she didn't mention (meet) him at the party.
5. I can't stand (see) animals in pain.
6. I must remember (set) my alarm clock tonight.
7. Dean's so sorry: he really didn't mean (hurt) you.
8. You won't find any spare parts; they stopped (make) them ages ago.
9. We went on (dance) even after the music had stopped.
10. We regret (announce) the cancellation of today's service due to ill health.
12. I promise (write) again soon.
13. I remember (ask) for a room as far away from the lifts as possible.
14. It's a good thing you recommended (bring) my own portable TV set from home.
15. I feel like (cook) something for myself rather than eating in the canteen.

12. **Choose the correct answer**:

1. At the top of the … there is a door to another room.

a) stairs b) steps c) ladder d) stair

2. He had no … of winning the race because he had no training.

a) time b) luck c) chance d) probability

3. The … entrance to the hospital is round the corner.

a) big b) head c) important d) main

4. Jenny spends most mornings doing … such as cleaning and tidying.

a) housework b) homework c) housing d) housekeeping

5. One feature of modern … is dependence on the computer.

a) company b) association c) union d) society

6. I didn't … her to behave that way.

a) await b) wait c) expect d) anticipate

7. The bad weather … our party.

a) spoiled b) damaged c) broke d) smashed

8. Some people are upset by violence on TV but … not.

a) another b) the other c) others d) any

9. It was a difficult day. Are you tired? - … .

a) A little b) Little c) A few d) Much

10. She hasn't eaten much at breakfast … .

a) too b) neither c) either d) also

Text 2

1. Read the text and send its contents in the Ukrainian language:

Beginning of modern science

About 300 years ago, modern science began. This science was a wonderful new way of finding out how and why things happen. It was based upon observation, upon experiment, and upon measurement. It was also based upon beliefs. Some of these beliefs have not yet been proved. Perhaps they never will be. Nevertheless, these beliefs are the foundation of modern scientific work.

Scientists believe, for example, that things happen with us a regular and orderly way everywhere in the Universe. This means that everything in our physical world can be predicated. If you cut your finger, it will bleed. If you throw something up into the air, it will fall to the ground. A scientist describes these regular and orderly ways as scientific principles. Scientists believe that everything in the physical world can be explained by these scientific principles. Scientists find the world as a fascinating place. They want to know more and more about why things happen as they do. Some scientists are especially interested in making new materials; they work in chemistry. Others are interested in heat, light, or electricity; they work in physics. Others want to know what happens inside the cells of plants or the human body; they work in the field of biology.

There are two kinds of work that scientists do. Some of them do basic research, called pure science. They study to find out the basic principles that govern our physical world. Other scientists work in applied science. In applied science, basic ideas are used for the solution of practical problems.

2. **Read and translate the following words. Make up sentences with them**.

Modern, an observation, measurement, a belief, nevertheless, a foundation, an orderly way, a universe, to predict, a finger, to bleed, to explain, fascinating, to happen, heat, a cell, a research, pure science, to find out, to govern, applied science, a solution

3. Match the words on the left with their drfinition on the right.

1. modern 2. to explain 3. to happen 4. pure 5. to find out 6. observation 7. to predict 8. to bleed	a) this especially about things that have not been planned before or that people don't expect; b) the answer to a problem; c) the fact that you notice or see something; d) to say that an event or action will happen in the future, especially as a result of knowledge or experience; e) using new methods, designs, or equipment; f) to lose blood;

9. heat 10. a solution	g) a substance or material that contains only one substance and is not mixed with anything else; h) to give someone the information they need to understand something; i) energy that is transferred from one body to another as the result of a difference in temperature; j) to get information about something, either by chance or by deliberately trying to get it.

3. Fill in the new vocabulary into the sentences.

1. We listened carefully while she … the process.
2. The accident … at 2 pm yesterday.
3. Seattle has a very … public transportation system.
4. When it first comes out of the ground, the oil is not very … .
5. It's really very simple – I'll try to … .
6. Do you have these shoes in a size 39? – I'm not sure. I'll just go and … .
7. The book is full of interesting … on?about the nature of musical composition.
8. What has …? Why are you crying?
9. Can anyone really … how the universe started?
10. Jogn has been married twice. – How did you find that out?
11. It's still not possible to accurately … the occurance of earthquakes.

4. Answer the questions to the text:

1. When did modern science begin?
2. What is the science based on?
3. Can everything in our physical world be predictable? Why?
4. What science is interested in making new materials?
5. What types of scientists do you know?

5. Choose the right answer:

1. When the Berlin Wallwas pulled down, it was a great moment in … history.

a) a b) an c) - d) the

2. Lots of people go for exotic holidays in Asia, but you must take care not to catch … malaria.

a) a b) an c) - d) the

3. Most of the watches you see today work on … quartz.

a) a b) an c) - d) the

4. The official report says that at least haf of the nation's monuments in England are in … desparate need of repairs.

a) a b) an c) - d) the

5. Physics … a lot of theoretical study.

a) involve b) involves c) to involve d) involving

6. Have you had … letters from Tom?

a) both b) a little c) too much d) a few

7. You … accused him of stealing the pen.

a) wrong b) in a wrongly way

c) wrongly d) wronglier

8. I am working at a tour guide, but I don't really regard it … a serious career.

a) like b) as c) such as d) a few

9. Why not … to my lady?

a) to speak b) speaking c) speak d) to speaking

10. Your trousers … nicely with this blue top.

a) go b) goes c) to go d) going

Text 3

1. Read the text and send its contents in the Ukrainian language:

Geometry in the Arts

Geometry is the basis of many things that we use and enjoy today. We know that nature uses geometric forms in the construction of crystals and in the sphere of plant and animal life. Very often the beauty found in nature is due to some geometric pattern or to these of numbers which are associated with geometry.

Man has discovered many other applications of geometry to the arts are easily seen, but others are latent and can't be seen at once.

Geometry is applied in painting, sculpture and architecture. Artists, sculptors and architects often use geometric forms and proportions. In painting the geometric figures are usually latent and they must be discovered. Some of the early painters whose works were based on geometric principles were Raphael, Michelangelo and Leonardo Da Vinci.

The geometry in architecture is both latent and visible. Almost every building is a harmonious arrangement of geometric forms. One of the most famous buildings of all times is the Parthenon, the largest of the group of buildings on the Acropolis in Athens. It was built in the years 497-488 B.C. and is famous for its perfection of form.

The plane figures which are most often used in architecture are the circle, rectangle, square and equilateral triangle. The Romans used these figures in determining the proportions of triumphal arches and the Italians in constructing Gothic cathedrals.

Sculpture maces even greater use of geometry than painting, especially when it is combined with architecture. Great art critics say that the beautiful lines of a statue show the action of the most exact mathematics.

2. **Read and translate the following words. Make up the sentences with them**.

To enjoy, a pattern, to be associated with, an application, latent, painting, an artist, an architect, to discover, visible, arrangement, to be famous for, perfection, a

plane figure, a circle, a rectangle, a square, an equilateral triangle, a triumphal arch, sculpture maces, to combine with, exact mathematics

3. Name in one word:

1. to get pleasure from doing something:

2. a regular arrangement of shapes, colours, or lines on a surface, especially one that is used to decorate paper, cloth, plates etc.;

3. someone who produces works of art, especially paintings or drawings:

4. people, places, books etc that are known about and talked about by many people in many places;

5. a number, amount, or time that is completely correct and is no more and no less than it should be;

6. able to be seen;

7. a four-sided flat shape where every angle is a right angle (90°);

8. a structure, consisting of a curved top on two supports, that holds the weight of something above it;

9. A shape or figure drawn on a 2-dimensional plane.

4. Translate the sentences from Ukrainian into English:

1. Мій батько любить грати в гольф на вихідних.

2. У парку було повно людей, які насолоджувались сонцем.

3. У вас є шпалери з таким самим малюнком, але іншого кольру.

4. Ми попросили молоду місцеву художницю прийти і показати студентам свої роботи.

5. «Девід Копперфільд» - одна з найвідоміших книг Діккенса.

6. Манчестер слаиться своїм нічним життям та своїми футбольними командами.

7. Можете сказати точний час?

8. Проходячи через арку, ви потрапляєте у відкритий дворик.

5. Answer the following questions:

1. How is geometry used in nature?

2. Where are geometric forms and proportions used?

3. Why is geometry important for architecture?

6. Choose the correct word:

1. We … any meat at the moment while we are on a diet.

a) haven't eaten b) are not eating c) don't eat d) are eaten

2. By the time Lisa got home, her mother … all the housework.

a) had done b) has done c) did d) was doing

3. We won't make a decision until we … the problem more thought.

a) give b) hadn't given c) don't give d) are given

4. 'Why are you so tired?' – 'Because I … all morning'.

a) jog b) was jogged c) have been jogging d) had been jogged

5. Jack … chess before so I showed him what to do.

a) hadn't been playing b) didn't play

c) wasn't playing d) hadn't played

6. The brochure says that the hotel has a great … on the sea.

a) appearance b) look c) sight d) view

7. She was … after three years with the company.

a) advanced b) elevated c) promoted d) raised

8. If you are overweight you'd better go on a … .

a) cure b) diet c) regime d) holiday

9. My friend is a true …, so he doesn't eat meat, fish and even milk products.

a) vegan b) vegetarian c) vogue d) verge

10. Jane and Brian got married a year after they got … .

a) divorced b) proposed c) engaged d) separated

Text 4

1. Read and translate the text.

ARCHIMEDES

Archimedes was the greatest mathematician, physicist and engineer of antiquity. He was born in the Greek city of Syracuse on the island of Sicily about 287 B.C. and

died in 212 B. C. Roman historians have related many stories about Archimedes. There is a story which says that once when Archimedes was taking a bath, he discovered a phenomenon which later became known in the theory of hydrostatics as Archimedes' principle. He was asked to determine the composition of the golden crown of the King of Syracuse, who thought that the goldsmith had mixed base metal with the gold. The story goes that when the idea how to solve this problem came to his mind, he became so excited that he ran along the streets naked shouting "Eureka, eureka!" ("I have found it!"). Comparing the weight of pure gold with that of the crown when it was immersed in water and when not immersed, he solved the problem.

Archimedes was obsessed with mathematics, forgetting about food and the bare necessities of life. His ideas were 2000 years ahead of his time. It was only in the 17th century that his works were developed by scientists.

There are several versions of the scientist's death. One of them runs as follows. When Syracuse was taken by the Romans, a soldier ordered Archimedes to go to the Roman general, who admired his genius. At that moment, Archimedes was absorbed in the solution of a problem. He refused to fulfill the order and was killed by the soldier.

Archimedes laid the foundations of mechanics and hydrostatics and made a lot of discoveries. He added new theorems to the geometry of the sphere and the cylinder and stated the principle of the lever. He also discovered the law of buoyancy.

2. Read and translate the following words. Make up sentences with them.

Entiquity, an island, to relate, to determine, a composition, a crown, to mix, a goldsmith, to solve a problem, excited, naked, to compare, a weight, pure, to immerse, to forget, bare necessities of life, to develop, death, to admire, a genius, to be absorbed, a solution, to refuse, to fulfill an order, to add, a lever

3. Match the words on the left with their definition on the right.

1. to mix 2. excited 3. to compare 4. to forget 5. to admire 6. to refuse 7. to add 8. an island 9. naaked 10. to obsess	a) to think about two or more things or people, in order to see how similar or different they are; b) to have a very good opinion of someone, either because they have achieved something special or because they have skills or qualities that you would like to have; c) it means that you think about it, him, or her all the time; d) to tell someone firmly that you will not do what they asked you to do; e) a piece of land completely surrounded by water; f) to no longer remember information, something that happened in the past, or something that you must do; g) to pour different liquids together so that hey can no longer be separated; h) not wearing any clothes; i) to put a new part or piece onto or into something, especially in order to improve it; j) feeling happy and full of energy, especially about something good that has happened or is going to happen.

4. Fill in the new vocabulary into the sentences.

1. You can make green by ,,, blue and yellow paint.

2. We looked at a lot of computers before buying this one, in order to … the prices.

3. Steve's coming home tomorrow – we're all really … .

4. If these two chemicals are … together they will explode.

5. If you … rents in London with rents in Paris, you'll find they are about the same.

6. I'm sorry, I have … your name.

7. I … the way she's brought up those children of her own.

8. I'm sure if you ask her to help you, she won't … .

9. It was an experience she would never … .

10. The book would look a lot more attractive if they … a few colour pictures.

11. They live **on** the large Japanese … of Hokkaido.

12. She used to … about her weight.

5. Answer the following questions:

1. When and where was Archimedes born?

2. How did he discover the famous principle known under his name in the theory of hydrostatics?

3. What was his emotional reaction to the solution of the problem?

4. What was Archimedes ordered to do when Syracuse was taken by the Romans?

5. Why did he refuse to fulfill the order?

6. What happened to him upon the refusal?

7. What were his contributions to science?

6. Choose the correct answer:

1. There is a beautiful stone … in the living room.

a) chimney b) fireplace c) bonfire d) pipe

2. I don't want a single ticket. Can I have a …?

a) double b) duplex c) return d) twin

3. We'll make a snowman tomorrow unless the snow … .

a) melts b) dissolves c) runs d) goes

4. The student decided to … the exam next June.

a) give b) take c) get d) make

5. He … 50$ per week working as a waiter.

a) wins b) takes c) profits d) earns

6. I won't accept your … for being late this time.

a) statement b) confession c) excuse d) accept

7. "… me help you clean the house," she said.

a) Allow b) Let c) Permit d) Accept

8. … of you need worry. I'm not ging to ask any of you for a loan.

a) None b) Neither c) All d) Some

9. I have … record the group has ever made.

a) all b) no c) every d) some

10. Fortunately, I have … time to spare.

a) little b) few c) no d) a little

Text 5

1. **Read and translate the text**:

EUCLID

Little is known to us about the life of Euclid. Very few of his works have survived. It is believed that Euclid lived in Egypt in approximately 330—275 B.C. When the famous Library of Alexandria was founded, he was invited to open the mathematical school. His most famous book on geometry which was called "Elements" was written by him between 330 and 320 B. C. This fundamental book written more than 2,000 years ago, is still regarded as the best introduction to the mathematical sciences. The book has been translated into many languages. Euclid's "Elements" is still used in Britain as a textbook on geometry.

It is said that when Euclid was asked if there was an easier way to master geometry than by studying “Elements”, he said, “There is no royal road to geometry.” Besides “Elements”, there is a collection of his geometrical theorems, “The Data”. The first printed edition of Euclid’s books appeared in the 15th century.

2. **Read and translate the following words. Make up sentences with them**.

To survive, to believe, approximately, to be founded, to invite, to be regarded, introduction, to master, royal, besides, data, to print, an edition

3. Name in one word:

1. to be sure that something is true or that someone is telling the truth;
2. to ask someone to come to a party, wedding, meal etc;
3. to continue to live or exist, especially after coming close to dying or being destroyed or after being in a difficult or threatening situation;
4. close to a particular number or time although not exactly that number or time;
5. to bring something into existence;
6. an occasion when something is put into use or brought to a place for the first time;
7. to learn how to do something well;
8. one of a series of printings of the same book, newspaper, etc., each issued at a different time and differing from another by alterationsют

4. **Translate the sentences from Ukrainianinto English:**

1. Чи повіртла міліція її історії?
2. Мені ніхто не повірив, коли я пояснив, зо пістолет не мій.
3. Це буде велике весілля – вони запросили понад сотню людей.
4. Ці рослини не можуть вижити в холодних умовах.
5. Жодна п’єс Шекспіра не збереглася в оригіналі.
6. Сім’я намагається вижити на дуже невеликі гроші.
7. Робота займе ижні коштуватиме приблизно 1000 фунтів стерлінгів.
8. Бостон був заснований у 1630 р.

9. У своєму заповіті вона залишила велику суму грошей на заснування заповідника природи.

10. Впровадження нови методів значно покращило продуктивність праці.

11. Він швидко опанував мистецтво опитування людей.

5. Answer the following questions:

1. Is much known to our contemporaries about the life of Euclid?
2. What country did he live in?
3. What is his most famous book on geometry called?
4. What is the scientific importance of this book?
5. In what quotation did Euclid stress the difficulty of mastering geometry?
6. What other book by Euclid is well known in the mathematical world?
7. When were his books printed?

Text 6

1. **Read and translate the following text:**

GALILEI

Galileo Galilei was an outstanding Italian astronomer who contributed to mathematics in the early part of the 17th century. Galilei was born in Pisa in 1564. He was the son of an impoverished Florentine nobleman. Galilei began as a medical student, but later he took up science and mathematics, in which he possessed remarkable talent.

When Galilei was 25, he was appointed professor of mathematics at Pisa, and at the same time he continued to perform experiments. But the social atmosphere was not friendly in Pisa, and in 1592, Galilei left that city and became professor of mathematics at Padua. Here, for nearly 18 years, he continued his experiments and his teaching and he became very popular.

In about 1607, Galilei heard of the invention of the telescope and he decided to make some instruments of his own. Soon he produced a telescope that had a magnifying power of more than 30 diameters. With his telescope, he observed sun-

spots, the mountains on the Moon, the phases of Venus, Saturn's rings, and the four bright satellites of Jupiter. These discoveries roused the opposition of the Church, and in 1633, Galilei was summoned to appear before the Inquisition and forced to recant and declare publicly that the Earth did not move. But the fight was not over. In 1634, Galilei finished another book, in which the ideas condemned by the Church were voiced again. Some years later, he became blind. He died in 1642.

To Galilei, we owe the idea of a harmony between experiment and theory. He founded the mechanics of freely falling bodies and laid the foundation of dynamics in general. He invented the first modern type of microscope. Galilei made very interesting statements showing that he had grasped the idea of equivalence of infinite classes, a fundamental point in Cantor's theory of sets in the 19th century, which has influenced the development of modern analysis. These statements and many of Galilei's ideas in dynamics were published in Leyden in 1638.

2. **Answer the following questions**:

1. What was Galilei by origin?
2. What centuries did he live in?
3. What did Galilei study when he first became a student?
4. What post was he offered when he was 25?
5. Why did he leave for Padua?
6. When did Galilei produce a telescope?
7. What did he observe with his telescope?
8. What was the attitude of the Church to Galilei's discovery?
9. What was he forced to do when he was summoned to appear before the Inquisition in 1633?
10. Did he give up scientific work after that?
11. What happened to him before he died?
12. What was Galilei's contribution to science?

Text 7

1. **Read and translate the text**:

Pierre de Fermat

Pierre de Fermat was born in Toulouse, France, on the 17th of August, 1601, and died on the 12th of January, 1665. He came from a wealthy family and studied law in Orleans. After graduating, he began to practise law. By 1652, he had become the chief magistrate of the criminal court. Magistrates in those days spent large amounts of time on their own. It was during this time that de Fermat worked in the field of mathematics. In fact, his devotion to this science was so great, that he spent as much free time as he could, working on mathematical problems and solutions. Although de Fermat published very little in his lifetime, he is still considered to be one of the greatest mathematicians of all times.

Pierre de Fermat made his greatest contribution to mathematics in number theory, and it had an important impact on the study of calculus. His works foreshadowed the later analytic geometry of Descartes and allowed him to define such important curves as hyperbola and parabola, the spiral of Fermat, and the cubic curve, known as the witch of Agnesi. In optics, Fermat formulated the principle of least time.

Together with the great French mathematician and inventor of the first calculating machine Blaise Pascal, Fermat also laid the foundation of probability theory.

Fermat's methods were so advanced that many of his results were not proved for a century after his death, and Fermat's last theorem took more than three hundred years to prove. He made his most important conjecture in number theory while reading the Arithmetica by Diophantus. He stated the problem, but added that there was too little room in the margin for his proof (he used to make notes in the margin of the books he was reading). His theorem was finally proved in 1994.

2. Answer the questions:

1. Where and when was Pierre de Fermat born?

2. What was the social status of his family?

3. What was his qualification?

4. How did he spend his spare time working as a judge?

5. Did Fermat publish much in his lifetime?

6. What was his greatest contribution to mathematics?

7. Were Fermat's results easily proved?

8. The work of what great mathematician helped him to develop number theory?

9. Where did he use to make notes and write proofs?

10. When was his last theorem finally proved?

Text 8

1. **Read and translate the text**:

ISAAC NEWTON

Isaac Newton, one of the greatest men in the history of science, was born in a little village in England in 1642. His father was a farmer and he had died before Isaac was born. The farm was situated in a lonely place where there were no schools, and Newton got his education in a school in the neighbouring village. At the age of twelve, he was sent to the Grammar school. Soon he became the best pupil in his school. Newton did not take part in games like his schoolmates, he spent a lot of time constructing models. He made a model of a windmill, a wooden clock that was driven by water, and other things. The mother wanted her son to become a farmer, so when he was fourteen, he began working on the farm. But soon his mother realized that it was no use teaching him farm work, because he was always busy reading books, constructing models or observing various phenomena in nature. At the age of nineteen, he became a student of Cambridge University. He began to study physics, astronomy and mathematics. Soon he became one of the best students there.

Once, when young Newton was sitting in the garden of his home, a ripe apple fell on his head. Newton took the apple and thought, "Why does the apple fall

down? Why doesn't it fall up instead?" So, he came to the conclusion that the apple and the Earth were pulling each other and began to think that the same laws of gravity extended far beyond the Earth. Newton deduced and calculated the force of gravity act- 82 ing between the Sun and the planets, thus establishing the law of gravitation in its most general form.

He studied the nature of light and colour and came to the conclusion that white light is composed of many different colours known to us as the spectrum. Such a phenomenon was quite unknown before Newton's work. These results laid the foundation of modern spectroscopy and greatly enriched the field of optics.

Newton developed a mathematical method indispensable in all questions concerning motion. This method is known by the name of differential and integral calculus. He discovered laws of motion which are still considered to be the basis of all calculations concerning motion.

Newton's contribution to science is so great that he may be considered the founder of modern mathematics, physics and spectroscopy. So long as humanity lives, Isaac Newton, the greatest of men of science, will never be forgotten.

Newton died in 1727 at the age of eighty-four and was buried in Westminster Abbey.

2. Answer the following questions:

1. What was Isaak Newton by origin?
2. Did he study well at school?
3. Was he interested in games?
4. What was his favourite occupation?
5. What did his mother want him to be?
6. What did he study at Cambridge University?
7. What helped him establish the law of gravitation in its most general form?
8. How did his works contribute to the field of optics?
9. What was his contribution to mathematics?
10. When did he die and where was he buried?

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Навчальне видання

МАЙБОРОДА Римма Вадимівна

ІНОЗЕМНА МОВА ЗА ПРОФЕСІЙНИМ СПРЯМУВАННЯМ

ЗАВДАННЯ ДЛЯ САМОСТІЙНОЇ РОБОТИ

Методичні рекомендації
для проведення самостійної роботи
з іноземної мови
для студентів математичних спеціальностей