

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РФ
ГОСУДАРСТВЕННОЕ ОБРАЗОВАТЕЛЬНОЕ
УЧРЕЖДЕНИЕ
ВЫСШЕГО ПРОФЕССИОНАЛЬНОГО ОБРАЗОВАНИЯ
«ВОРОНЕЖСКИЙ ГОСУДАРСТВЕННЫЙ
УНИВЕРСИТЕТ»

**Английский язык для
студентов-математиков**

Учебно-методическое пособие

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Учебно-методическое пособие подготовлено на кафедре английского языка естественно-научных факультетов факультета романо-германской филологии Воронежского государственного университета.

Учебно-методическое пособие представляет в концентрированной форме систематизированный материал для приобретения навыков устной и письменной профессиональной речи, состоит из шести разделов. Каждый раздел содержит тексты для чтения и перевода по математической тематике и лексико-грамматические упражнения по развитию навыков всех видов чтения, монологической, диалогической и письменной речи.

Учебно-методическое пособие предназначено для студентов 1, 2 курсов дневного отделения математического факультета.

Unit 1

Before you read

Discuss these questions with your partner.

- Why do people study Maths?
- When do you use it?

Vocabulary

a. Match these words with their definitions.

1	magnitude	A	the basic elements of arithmetic which are used for expressing, recording quantities or measures of various kinds
2	property	B	a measure of object size
3	number	C	a statement which is assumed to be true, and is used as a basis for developing a system
4	axiom	D	some particular fact which is true for an object or, all the objects in the group
5	theorem	E	a sequence of statements leading to the establishment of the truth of one final statement
6	multiplication	F	the operation of combining numbers
7	addition	G	a statement which has been proved to be true
8	proof	H	the operation which combines several equal measures of size giving the result as a single number

b. The underlined words are all in the wrong sentences. Put the words into the correct sentences.

1. It is a magnitude of squares that their diagonals cross at right angle.
2. We use axioms in arithmetic.
3. 32 million and 35 million have a difference of 3 million but, as this is less than 10 % of either of them, it could be said that they are of the same order of property.

4. The Egyptians couldn't solve the problems of arithmetic that involved fractions.
5. In geometry, the Egyptians were able to find areas of triangles, rectangles and trapezoids, the volumes of figures such as bricks, cylinders, and pyramids.

Before you read

Discuss these questions with your partner.

- What is your native language?
- Is mathematics a special kind of language?
- Can people speaking different languages understand mathematics?
- Do you know the names of any important people connected with mathematics in history?

Vocabulary

a. Match the words to make phrases.

1. foremost	A. a common phrase
2. to use	B. reasons
3. scientific	C. world
4. unspoken	D. age
5. civilized	E. language

b. Match these words with their definitions.

1. symbol	A. the operation between two numbers which measures how many times bigger one number than the other
2. division	B. a way of drawing things so that they look real
3. special	C. a letter or sign used to represent instructions
4. circumference	D. another number which when squared will equal the first number
5. infinity	E. the distance measured around the curve which makes the circle
6. square root	F. the concept of a space, time or quantity that knows no bounds

Pronunciation guide

reason ['rizən]

specialize ['speʃəlaɪz]

imply [ɪm'plaɪ]

quantitative ['kwɒntɪtətɪv]

spatial ['speɪʃl]

purposefully ['pə:pesfəl]

Text 2. Mathematics – The Language of Science

One of the foremost reasons given for the study of mathematics is, to use common phrase, that “mathematics is the language of science”. This is not meant that mathematics is useful only to those who specialize in science. No, 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 sense, is an- unspoken language. There can be no more universal or more simple language, it is the same throughout the civilized world, through 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 (x), 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 mind 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 the special kind of language. One so perfect and abstract that – hopefully it may be understood by intelligent creatures throughout the universe, however different their organs of sense and perception. 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, π for the ratio of the circumference to the diameter of a circle; sin (for sine), cos (for cosine) and tan (for tangent) for the ratios between sides in a right triangle; $\sqrt{\quad}$ for a square root, ∞ for infinity, B, \sum , Ω for assorted other concepts in higher mathematics.

All of these symbols are tremendously helpful to the scientist because they serve to short-cut his thinking.

assort – группировать,
классифицировать

circumference – окружность

intelligent – разумный
root – корень

ratio – отношение
tangent – касательный, тангенс

Comprehension

Read the text and answer the questions in your own words.

- 1) Whom is mathematics useful to?
- 2) What does the language of mathematics consist of?
- 3) What are the best known symbols of mathematics?
- 4) How can mathematicians make transitions in reasoning?
- 5) What does mathematics express symbolically?
- 6) How is the language of mathematics designed?
- 7) What symbols of mathematical vocabulary do you know?

Speaking

Discuss these questions with your partner:

- How important is the study of mathematics for our world today?
- Would you prefer to study it? Why?
- Are there any areas of mathematics which you think are more important than others?

Task: Prepare a short presentation to answer the question: “What is mathematics?” Use the information in both texts.

Talk about:

- What the study of mathematics includes
- Primitive counting system
- The difference between the Babylonian system of numeration and Egyptian system
- The invention of an abstract mathematics by the Greeks
- The use of symbols in modern mathematics

Writing

Write a letter to your teacher telling him or her which areas of mathematics you would like to specialize in and why. Use these notes to help you.

Dear Mr/Mrs (teacher's surname),

Writing to tell you choices I have made

Specialize in: (one or two of the main areas)

Reasons for choosing: interested in (algebra/geometry/scientific work/your own ideas)

Possible career choices: what I hope to do when I graduate (a school teacher, an engineer, your own ideas)

Offer to meet and discuss choices: I would like your advice and hope we can ...

Yours sincerely,

(Your full name: first name + surname)