

КАЛИНИНГРАДСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ

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МАТЕМАТИКА. ЧИСЛИТЕЛЬНЫЕ.

Учебное пособие по чтению и переводу математических текстов, знаков, символов, сокращений на английском языке.

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Математика. Числительные. Учебное пособие по чтению и переводу математических текстов, знаков, символов, сокращений на английском языке / Калинингр. гос. ун-т; сост.: доктор филологических наук профессор В.М.Аристова - Калининград, 1999. - 57 с.

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Contents

Оглавление

1. Preface.	Предисловие.	4
Mathematics. Numerals.	Математика. Числительные.	5
2. Peculiarities in use and reading.	Особенности употребления и чтения.	7
Dates, years, centuries.	Даты, годы, века.	10
English and American money.	Английские и американские деньги.	13
Numerals with the names.	Числительные с именами.	14
Times.	Время.	15
Telephone numbers.	Телефонные номера.	17
Numbers with nouns.	Числительные с существительными.	17
Numbers in defining clothes and foot-wear sizes.	Числа-определения размеров одежды и обуви.	18
The word "one".	Слово "one".	19
Strange numbers.	Странные числа.	20
3. English signs and symbols.	Английские знаки и символы.	21
4. Abbreviations in maths.	Сокращения в математике.	25
English and American abbreviations in metric system of measures.	Английские и американские сокращения в метрической системе мер.	32
<i>Linear measures. Square measures. Cubic measures. Weight measures. Angles. Temperature.</i>	<i>Линейные меры. Меры площади. Меры объема. Меры веса. Углы. Температура.</i>	
5. Operations in maths. <i>Addition and subtraction. Multiplication and division. Involution and evolution.</i>	Математические действия. <i>Сложение и вычитание. Умножение и деление. Возведение в степень. Извлечение корня.</i>	35
Fractions. Common and decimal fractions.	Дроби. Простые и десятичные дроби.	37
Ratio. Proportions.	Отношения. Пропорции.	38
Equations and Identities.	Уравнения и тождества.	38
Reading formulae.	Чтение формул.	39
6. Addenda.	Приложение.	41
Latin and Greek singular and plural forms.	Ед. и мн. число латинских и греческих терминов.	41
Reading proper names.	Чтение имен собственных.	42
It is interesting to know.	Это интересно знать.	45
List of terms and expressions.	Список терминов и выражений.	49

Предисловие

Данное пособие-справочник предназначается для студентов, аспирантов-математиков, для начинающих преподавателей английского языка и/или математики с целью выделить трудности английского языка математики: особенностей чтения числительных, их употребления, перевода, значения математических знаков, символов, сокращений, математических действий.

Многолетняя работа со студентами и аспирантами математиками и отсутствие словарей-минимумов по чтению специальной научной литературы вызвали необходимость создания пособия-справочника, который поможет обучающимся получить некоторые адекватные сведения по математике и освоить практику чтения математических знаков, формул, действий на английском языке.

Справочный характер пособия предоставит возможность использовать его: при переводах единиц английских мер в принятые международные или русские меры, температур различных шкал; список слов и выражений (естественно, неполный по техническим причинам), представленный в Приложении поможет в переводах с английского на русский и с русского на английский, поскольку список составлялся с учетом типичных ошибок, допускаемых обучающимися; а также некоторых выражений с числительными, которые могут быть использованы в устной речи и в курсе Business English; при чтении иностранных и древнегреческих имен, греческих букв, которые часто произносятся также, как и в русском языке математики.

Пособие-справочник предусмотрен как общий минимум необходимых сведений по математике, не выделяя различные предметы математики, такие как алгебра, геометрия, вычислительная и прикладная математика и т. д. Поэтому пособие может быть использовано физиками, экономистами и др. специалистами, которым элементы математического профиля не чужды.

Mathematics — математика

Numerals — числительные

Nowadays there exist two systems of numeration: the Roman's numerals based on the counting and widely used the Arabic numerals founded on the angles presented in each number:

The origin of our modern decimal or base 10- number system can be traced to ancient Egyptian, Babylonian (Sumerian) and Chinese roots.

Base 60- number system also goes back to the Babylon of ancient times. The traces of it can be found in dividing an hour and a degree (градус) into 60 minutes and in a minute — into 60 seconds.

In the ancient Rus the numbers were represented by letters from Slav alphabet, simple letters being used for small numbers (A — 1; B — 2 etc) and the letters with special signs (titles) above were used for greater quantities:

•

A — 100,

\bar{A} — 10000.

Since the Dark Ages Roman's numerals were used in Europe and Russia for counting decimal digits: I - 1, X - 10, C - 100, M - 1000 and their halves: V - 5, L - 50, D - 500.

Since the 9th century AD alphabetic letters also served (and serve now) in mathematics as numerals, Latin and Greek letters being most frequently used. Latin and Greek letters in mathematics are the same in different languages as international signs, but they are read differently in different languages.

If they are used in English they must be read as the English people used to read them.

In Russian these letters are pronounced as in Latin, but in English they have their English pronunciation because of the similarity of English and Latin alphabets.

So in Russian a is [a], but in English it should be read as [eW], x - [eks], y - [waw] etc Thus, for the right pronunciation English alphabetical reading of letters must be learned well. Greek letters retain their Greek nominations but they must be pronounced with an English "accent":

Greek alphabet

Greek letters			
! "	alpha	['ʒɪf"]	альфа
# \$	beta	['beɪtɪd, 'bi:tɪd]	бета
' (gamma	['gʒmɪd]	гама
) *	delta	['deɪtɪd]	дельта
+ g	epsilon	['ep's"ɪldn]	эпсилон
- .	dzeta	['zeɪtɪd, zi:tɪd]	дзета
/ 0	eta	['eɪtɪd, 'i:tɪd]	эта
1 h	theta	['>eɪtɪd, '>i:tɪd]	тэта
3 4	jota	["ɪ'outɪd]	йота
5 6	kappa	[kʒpɪd]	каппа
7 8	lambda	[lʒmɪdd]	ламбда
9 :	mu	[mjɜ:]	ми, мю
; <	nu	[njɜ:]	ни, ню
= >	xi	[ksi:]	кси
? @	omicron	[ou'm"ɪkrɪdn]	омикрон
A B	pi	[pɪ]	пи
C D	rho	[rou]	ро
E F	sigma	['sɪgmɪd]	сигма
I J	tau	[t"u]	тау
K L	upsilon	[ju:p's"ɪlon]	ипсилон
M N	phi	[fi:]	фи
O P	chi	[hi:]	хи
Q R	psi	[psi:]	пси
S T	omega	[ou'mi:gɪd]	омега

Binary number system is used now in some electronic computers, every number being expressed by means of two digits — 0 and 1.

Concerning English units of measurements it should be said that it stands aside from International Metric System. The International decimal system of measures (Metric System) is based on the *metre* and *kilogramme*. Thus, distance and length are usually measured in millimetres, centimetres, metres, kilometres; mass is measured in grams, kilogrammes, centners and tons.

This Metric System (metre — kilogramme — second — MKS) was proposed by France and was accepted universally in science by many countries. Its main advantage is the decimal nature, i. e. all metric units can be divided into 10, 100, 1000 etc. parts. And that is why all fractional measures may be expressed as decimals and they are certain to be manipulated much easier in mathematics.

The English System of measurements is much more complicated notwithstanding the fact of accepting International Metric (decimal) System some twenty years ago. Up till now the English System uses: foot, yard, and mile as units of distance and length; ounce, pound and ton as units of weights and force.

This system is called Foot-Pound-Second (F.P.S.) and it is used in Great Britain and the United States of America. But still the units of measurements in England and USA are not always quite the same. For instance, British units include: barleycorn (8.47 mm), line (2.12 mm), skein (109.7 m), rope (6.096 m), fathom (1.8 m), ell (1.14 m), pace (1.14 m) etc. and the American system of measures has not got them.

The numeral meaning of one and the same unit may be different: in Britain a cable's length — 219 metres, while in the USA it is 183 metres. The same difference may be found in other units of measurement. So it is necessary to look up the numerical meanings of units in the English-Russian Polytechnical Dictionary to distinguish between British and American measures.

Peculiarities in Use and Reading Numerals

There are some peculiarities of reading English numerals in comparison with Russian: while reading and spelling cardinal and ordinal numerals pay attention to the underlined numerals:

one <i>один</i>	<u>the first</u> <i>первый</i>	first <i>сначала</i>		
two <i>два</i>	<u>the second</u> <i>второй</i>	secondly <i>во-вторых</i>		
three <i>три</i>	<u>the third</u> <i>третий</i>	thirdly <i>в-третьих</i>	<u>thrice</u> <i>трижды</i>	
four <i>четыре</i>	<u>the fourth</u> <i>четвертый</i>	fourteen <i>четырнадцать</i>	<u>forty</u> <i>сорок</i>	<u>the fortieth</u> <i>сороковой</i>
five <i>пять</i>	<u>the fifth</u> <i>пятый</i>	<u>fifteen</u> <i>пятнадцать</i>	<u>fifty</u> <i>пятьдесят</i>	<u>the fiftieth</u> <i>пятидесятый</i>
six <i>шесть</i>	<u>the sixth</u> <i>шестой</i>			
seven <i>семь</i>	<u>the seventh</u> <i>седьмой</i>	seventeen <i>семнадцать</i>	seventy <i>семьдесят</i>	<u>the seventieth</u> <i>семидесятый</i>
eight <i>восемь</i>	<u>the eighth</u> <i>восьмой</i>	eighteen <i>восемнадцать</i>	eighty <i>восемьдесят</i>	<u>the eightieth</u> <i>восмидесятый</i>
nine <i>девять</i>	<u>the ninth</u> <i>девятый</i>	<u>nineteen</u> <i>девятнадцать</i>	<u>ninety</u> <i>девяносто</i>	<u>the ninetieth</u> <i>девяностый</i>
ten <i>десять</i>	<u>the tenth</u> <i>десятый</i>			

Hundreds with other numerals are read with "**and**".

155 - a (one) hundred **and** fifty five.

203 - two hundredd **and** three.

1,451 - a (one) thousand four hundred **and** fifty one.

2,050,180 - two millionn fifty thousand one hundred **and** eighty.

15,500,250 - fifteen millionn five hundredd thousandd two hundredd **and** fifty.

You have noticed that every three numbers from right to left are separated by a comma (,). (In Russian comma is not used in this case, it is used in decimal fractions.)

In scientific and technical texts the authors prefer writing large numbers not with commas, but leaving a space after every three figures beginning from the end: 21 000 254; 3 560 021.

Since commas are used to separate thousands in figures do not put figures next to each other — it may be taken as part of the same number: "The hall can hold 700, 150 of whom have to sit on folding chairs". Rephrase as: "The hall can hold 700, of whom 150 ...".

In greater numbers¹ there does not exist strict quantitative unification concerning different countries. So, dealing with this or that greater number it is to be kept in mind that:

in:	the USA	Great Britain	English units	Russian units
billion	10^9	10^{12}	milliard	миллиард
trillion	10^{12}	10^{18}	quintillion	триллион
quadrillion	10^{15}	10^{24}	septillion	квадриллион
quintillion	10^{18}	10^{30}	nonillion	квинтиллион
sextillion	10^{21}	10^{21}	sextillion	секстиллион
octillion	10^{27}	10^{27}	octillion	октиллион
nonillion	10^{30}	—	—	нониллион

Numbers in figures or words.

In scientific, technical, statistical material numbers are written as figures. In other types of texts the general rule is to write small numbers as words and large numbers as figures: Seven students were present. During the earthquake 4 653 people perished. Do not mix figures and words in one phrase: "from 10 to 30" but not: "from ten to 30".

If large numbers are used at the beginning of the sentence they are written as words: "Four hundred animals died in the flood last year". In case the number is long it must be used in the end of the sentence: "The floods killed 400 animals".

¹ The data are taken from English-Russian Polytechnical Dictionary - M., 1971; Orlov V.B. at al. Russian - English - German - French Mathematical Dictionary - M., 1987.

The word "*number*" is translated as "*несколько, некоторые*" if it is used with the indefinite article and the verb after it is in the plural form: "There are (not is) a number of reasons against this project". "A number of them prefer tea".

The word "*number*" is translated as "*количество*" when it is used with the definite article and takes a singular verb: "The number of books increases every year". "The number of boxes is not very great".

Notes:

a half dozen or half a dozen — полдюжины

12 — a (one) dozen — одна дюжина

24 — two dozenn (not two dozens) — две дюжины

20 — a (one) score — два десятка, двадцать

70 — three score years and ten — 70 лет

Dates, Years, Centuries:

While reading years the numeral is divided into two parts and it is not necessary to add the word "year":

1822 - eighteen twenty two;

1905 - nineteen 0 [ou] five;

1997 - nineteen ninety seven;

1600 - sixteen hundred;

В 60-х годах XX века — In the sixties of the twentieth century.

Еще 10 лет назад — As recently as ten years ago.

Спустя десять лет, через десять лет — Ten years after / later.

20-е гг. XIX в. — The twenties of the nineteenth century.

В период средневековья — In the Dark Ages.

В начале 30-х годов прошлого века — In the early thirties of the last century.

До сего времени — (Up) till now; hitherto.

В середине пятидесятих годов XX столетия - In the mid of the twentieth century.

В конце девяностых годов — In the late 1990 s.

1-го мая 1951 — On the first of May, 1951.

Первое мая 1951 — the first of May, 1951.

Двадцать первое января 1983 г. — The twenty first of January 1983 or January the twenty first 1983.

Еще (уже) в 1926 году — As long ago as in 1926.

Не так давно в 1978 — Not long ago in 1978.

Раньше / Позднее в 1993 году — More recently in 1993 or Later in 1993...

The dates in Great Britain are written in a short form in a way we do it: 6.08.1967. or 6/8/1967 it means: the 6th of August, 1967.

In the USA this data will be understood as June, 8, 1967 i. e. they write first the month, then goes the day and then the year: 8.06.1967. or 8/06/67.

To avoid this difference between American and British users a certain practice in Europe was introduced: small Roman numbers for the months are used now 8.VI.67; 5.III.97; 10.XI.96; 1.I.98.

The year alone may be abbreviated in informal style, an apostrophe is then used: in '45, after '90.

For the decades use "s": in the late '60s and early '70s.

A dash (-) is used to represent periods: In May - July 1996; During 17-19 September; During 6 April 1997 - 16 April 1997; In the period 1917-1990; In the XIX-XX cc.

It is not necessary to repeat the first two figures in years if they are the same: during 1924-37; 1996-97; a slash (/) is also possible: 1981/90; 1996/97 academic year. The propositions "from" and "between" are used before each year: from 1941 to 1945 (not "from 1941-1945"); between 1938 and 1953 (not "between 1938-53").

Какое сегодня число?

What's the day to-day?

Сегодня пятое сентября.

To-day is the fifth of September.

В этом, прошлом, будущем году.

This year, last year, next year.

Сколько вам лет?

How old are you? I am twenty.

Сколько ему годиков?

How old is your child?

Ему четвертый год.	He is in his fourth year.
Менее чем за год.	In less, than a year.
Когда этот ученый жил?	What is the lifetime of this scientist? His lifetime is 1896-1960.
Он еще несовершеннолетний	He is in his nonage ['nɒnɪʒ]
Он глубокий старик — ему за 90.	He is a nonagenarian [nɒnɪʒənəriən]
В году 365 дней 6 часов	One Julian year has 365 days, 6 hours, or 52 weeks, one day; or 13 lunar months, 1 day.

If you speak about the age of a person for some legal purpose (of pension rights or something like it) the full phrase is used: At age 60; at the age of 60. In common use the age is written in number after the personal name, in commas: "David Hare, 49, was on his way to New-York"; "Joe McCafferty, 7, died in the fire"; "Emily Solvani, 8, was saved ..." etc.

Mind the pronunciation: aged — взрослый, зрелый, спелый — [eɪʒd]; aged — старый, пожилой, слабый — [eɪʒɪd].

Remember this short rhyme:

Days in the Months

30 days has September
 April, June and November
 All the rest have 31
 Only February alone
 Has 28 days, and it's clear
 It has 29 in the leap year.

The abbreviations BC < English — (Before Christ) and AD < Latin — (Anno Domini) which mean: *до нашей эры; нашей эры* are used : BC after the years — 1358 BC — *в 1358 г. до н. э.*, 3000 BC — 3 thousand BC.

AD is used before the years and only for the earlier years: AD 51, AD 83. But if you have four-figures year (1520, 1066, 1022) — AD is not used before the years.

English and American Money

The word money is usually singular. If it is used in plural it may have the forms "moneys" and "monies" and mean different currencies, i. e. money of different countries.

In Great Britain and the USA there are special signs to denote money. These signs emerged mostly as abbreviated forms from common words except \$. They are used only in their written forms, in speech they are pronounced as common words:

, < ,ibra — pound of sterling — фунт стерлингов = 20 шиллингам; 100 пенсам.

s < shilling — шиллинг — 1/20 фунта.

d < denarius (устаревшее) — пенни, пенс.

p < penny, pennies, pence — пенни, пенс, пенсы.

gu., gs. < guinea, guineas — гиней, гиней; 1 гиней = 21 шиллингу.

\$ < dollar (since 1786) — доллар = 100 центам.

C < cent — цент = 0,01 доллара.

In Russian we denote the sum of money after numerals: 20 руб. 50 к. In English the larger sum of money (dollars, pounds of sterling) has the signs before numerals: \$ 200; , 80, but it must be read: two hundred dollars; eighty pounds of sterling or eighty quid (slang).²

The smaller money — shillings and pennies in Great Britain are written after the numerals: , 80 5 s. 2 d (p) or , 80 5/2. The sum is read: eighty pounds, five shilling, twopence ['tʃɪpɛns].

The same goes for USA smaller money: \$ 247 30 C — two hundred and forty seven dollars thirty cents. More often penny or cent signs (P, C) are not written with pounds and dollars: \$ 247.30 or , 80. 5/2.

It is not recommended to use both the symbol and word for the currency. Write ,10 (not ,10 pounds), \$100 (not \$100 dollars).

² 'quid' is a slang word for "pound of sterling". It is used only in a singular form: He earns fifty quid a week = , 50 в неделю.

Beware of using abbreviations:

,10 m— ten million pounds, and

,10 k — ten thousand pounds where they might be misunderstood (k<kilo — meaning thousand).

If you want to say about maney as about the whole sum the singular verb is used: "Fifty pounds is all I have and I need it". "Five roubles is quite enough" — Ср.: *Пять рублей будет вполне достаточно.*

The sign @ often shows the price or the limits of price: vegetable oil @ 3 s. 2p. per quart. — *Растительное масло по 3 шиллинга 2 пенса за кварту.* Vegetable oil 3s @ 5s. — *Растительное масло от 3 до 5 шиллингов.*

In the USA the word "buck"³ (dollar) and the word "dime" (10 cents) are widely used in speech. So the Americans now have some phaseological units with these monetary terms: To be in the bucks — *быть при деньгах* and Not to care a dime — *ни в грош не ставит, не ценить*; A dime a dozen — *дайм за дюжину, очень дешево, дешевле пареной репы.*

Be careful in translating: the letter "d" serves as abbreviation to several words denoting money:

d — denarius — penny, pence	пенс (устар.)
— dollar	доллар
— dime	10 центов

Numerals with the Names

Numerals with the Names: are read as ordinal numbers and Roman figures are used after a proper name:

Peter I — Peter the first — *Петр Первый*

Catherine II — Catherine the second — *Екатерина II*

Elizabeth II — Elizabeth the second — *Елизавета II*

³ This slang word is supposed to have come into American English from the Northern American-Indian language where it meant buckskin — оленья шкура, кожа; which had been used as a unit of barter at that time.

Charles I — Charles the first — Карл I

Louis XIV — Louis the fourteenth — Людовик XIV и т. д.

If the proper names or their abbreviated forms are given to nominate devices, mechanisms, plants, etc., the numbers after them, usually written with a dash (Boeing-747, TU-154, U-2 etc.) give information on the number of the model, brand, trademark, sort, measure, year, cardinal number of issue etc. "Viola-3", "Michurin-5" the sorts of peas are meant; Boeing-747, TU-154, U-2 — the figures show the model of planes. In this case the numbers are written in Arab figures.

In abbreviation WWI and WWII it is possible to read either: World War the first, World War the second or World War One, World War Two.

Time

Hours, minutes, seconds. Two signs: . (point), : (colon) are used to divide hours and minutes in everyday life. When it is necessary, say, in laboratories, seconds are used as the third number. Officially at the airports, railway stations the depart time is written:

To New York: 8.30 11.10 14.30 etc. without the letters a.m. or p.m.

To Granada: 11 p.m.

In hotels: breakfast 6.30 — 10 a.m.; dinner 8 — 11.30 p.m.;

supper 10 p.m. — 3 a.m.

завтрак с 6.30. до 10 утра; обед с 8 до 11.30 вечера; ужин с 10 вечера до 3 ч. ночи.

The propositions should be kept in mind:

Great Britain: past (после), to (без ... пяти пять)

USA: after (после), of (без ...)

The hours are read in Great Britain:

09.00 = ou nine hundred hours = 9.00 am

12.00 = twelve hundred hours = 12.00 — midday / noon

19.00 = nineteen hundred hours = 19.00 = 7.00 pm — seven 00 pm

14.25 = fourteen twenty five = 02.25 = two twenty five pm

5:15, 5.15 утра / ночи — It's a quarter past five, or it's five fifteen AM/PM.

20:08, 20.08 — It's eight minutes past eight PM, or it's eight O[ou] eight PM.

Звоните с 8 утра до 8 вечера с понедельника до пятницы — Call / Ring from 8 am — 8 pm Monday to Friday.

Он придет с минуты на минуту, с часу на час — He is to come any moment.

Telephone numbers

Telephone numbers are read by every number separately: no digit above nine is used.

2•1•5•7•3•6 (in Russian we usually read them by two numbers - 21•57•36) - two•one•five•seven•three•six.

The same two numbers can be pronounced as "double" numbers: 2•2•0•0•5•1 — double two, double O [ou], five•one; 44•61•27 — double four six one two seven; 0500001100 — O [ou] five double O, double O, double one, double O.

Rhythmically the whole number is grouped in pairs (beginning from the first pair) 05/6•1/7•3/2•7/5•9/. If the telephone number includes a code number this code is separated by a longer pause: 0•8//2•5•0//1•3/2•7/4•6/7•1/.

The only exception is the Great Britain's emergency call 999 which is always pronounced: nine nine nine.

Numbers with nouns.

The third room and room 3 is not one and the same room. The third room is the room after the second one if you count them. Room 3 means the number of the room: No 3, #3. Class 5 (five), building 3 (three), block 7 (seven); lesson 15, paragraph seven, page five, door two, desk four etc.

While speaking the following prepositions are used:

Он живет **в** доме 7. He lives **at** 7.

Он живет **в** номере 7 (гостиницы, общежития) He lives **in** 7.

Он живет **в** доме 2, квартира 4. He lives **at** 2, flat 4.

На первом этаже. **At** the ground floor

На втором этаже.

On the first floor (on the 1st floor).

На третьем этаже.

On the second floor (on the 2-d floor).

В несколько раз, больше, меньше (times, -fold)

В два раза больше: о предметах, величине, объеме:

This table is two times larger (bigger).

That square is ten times greater.

О весе: heavier (тяжелее):

Honey is two times heavier than the water.

This box is three-fold heavier than that one.

The construction of this bridge must be strengthened five-fold.

Больше, меньше, старше, моложе на ...

Муж старше на 5 лет — The husband is older by five years / The husband is five years older.

My elder sister is younger than her husband by 10 years.

Повышение цен на 12 фунтов — A rise of prices by 12 pounds.

Numbers for clothes and foot — wear sizes.

Measurements around the parts of the body may be in inches or centimetres:

She is 36-24-36 — means that she is 36 inches round the bust, 24 inches round the waist, 36 inches round the hips;

She is 91-61-91 — means: 96 cm round the bust, 61 cm round the waist, 91 cm round the hips.

As to the person the word "tall" (not "high") is used "My mother is 5 foot/feet six inches tall (5 ft 6 in = 5'6")" or "My mother is one metre sixty-eight centimetres tall" (1 m 68 cm / 1•68 m).

Strange as it may seem, there is no unification in determining the sizes of human bodies. Here is a comparative table of women's and men's sizes for clothes and footwear:

Sizes (sz.) for:

Countries:	Women clothes						
Russia	42	44	46	48	50	52	54
England	10	12	14	16	18	20	22
USA	8	10	12	14	16	18	20
	Women shoes, foot-wear						
Russia	34	35	36	37	38	39	40
England	3	3.5	4	4.5	5	5.5	6
USA	4	4.5	5	5.5	6	6.5	7.5
	Men clothes (suit and coats)						
Russia	42	44	46	48	50	52	54
England	35	36	37	38	39	40	42
USA	35	36	37	38	39	40	42
	Men foot-wear (shoes and boots)						
Russia	38	39	40	41	42	43	44
England	5.5	6.5	7	8	8.5	9.5	10.5
USA	6	7	7.5	8.5	9	10	11

The Word "One"

Care should be taken while translating the word "one" because it may be:

1) a numeral (один, единственный): one fine day — в один прекрасный день; one fire drives out another — один пожар тушит другой; ≈ клин клином вышибает.

2) an indefinite pronoun: in the function of the subject it is not translated, because in Russian it is an impersonal sentence (безличное предложение): One can't read in the darkness — нельзя читать в темноте. One should be careful crossing the street — Следует соблюдать осторожность (быть внимательным) переходя улицу.

3) a substitute word to avoid the repetition of the previous noun(s). In this case it has a singular (one) and a plural (ones) forms depending on the noun it replaces and articles: Bread, meat, butter, vegetables are common substances, the ones which people live on. He was the best student at the University, the one to be sent to the Conference. You have brought a red book, but I asked you to bring a black one.

Notes: единство — unity; односторонний — unilateral; единорог — unicorn; единственный — the only.

Strange Numbers

There are some English numbers, which cannot be translated according to their numerical meaning, for instance: A dozen of scientists went to London to take part at the conference (Дюжина ученых по-русски не звучит, выбираем более подходящее числительное — двенадцать человек, более десяти, несколько).

"You look like a hundred (million) dollars" — Вы выглядите на сто (миллион) долларов — для русского перевода неприемлемо. Опускаем числительные — "Вы хорошо (отлично) выглядите".

Some expressions with numerals are rather clear: seven wonders - семь чудес света; Nine tenth - девять десятых, т. е. почти все; fifty-fifty — поровну; six of one and half a dozen of the other (six and half of dozen) — одно и то же; что в лоб, что по лбу.

But there are expressions with numerals which are not easy to translate without special knowledge:

- go like sixty; like sixty — стремительно, быстро, ужасно, очень сильно
- catch 22 — букв.: ловушка 22 — абсурдное правило, закон, мешающий выйти из замкнутого круга
- to go over like nine pins (ninerpins) — выходить из строя один за другим
- to be in two minds, to have two minds — не знать что выбрать, колебаться
- a nine days wonder — злота дня, предмет кратковременной сенсации
- to the nines — в совершенстве, тщательно (одет), до небес (хвалить), сделать что-то великолепно
- to talk (run, go) nineteen to the dozen — говорить без умолку, трещать
- eighteen carat lie — наглая, вопиющая ложь
- one over the eight — подвыпивший
- make (the) two ends (of the year) meet — сводить концы с концами, т. е. жить в нужде
- three R's - reading, (w)riting, (a)rithmetic — чтение, письмо, арифметика
- three sheets in the wind — вдрызг пьяный

- seven sisters — Плеяды (созвездия)
- to be first out of the gate — вылезти первым, до времени
- three sisters — парки, мойры (богини человеческой судьбы) и т. д.

That is why be careful translating numerals — they are often used not only in their numerical sense but also in metaphores, as phraseological units, in stock phrases.

- to bat a thousand — быть во всем удачливым, иметь потрясающий успех. Иронически: ну, ты даешь.
- to make it to first base — создавать первооснову, заложить первый камень (в контактах, отношениях)
- to go in headfirst — ринуться во что-то, не посчитавшись с обстоятельствами и др.

3. English Signs and Symbols

Signs and symbols in Mathematics are international in majority, but there are some signs peculiar to the English language of mathematics, physics and technology which should be learnt:

- ÷, /, — the signs of division corresponding to the Russian signs /, —, :, $\frac{\quad}{\quad}$
- , : — the signs of multiplication.
- , × — the sign (×) can also have the meaning "from...to", "up to" (от и до) —
 $1 \times 1.1; 1.2$ is read — from one to one point one, one point two (от одной до 1,1; 1,2); $1/2 \times 1/4$ inch — from one half up to one fourth inch (от 1/2 до 1/4 дюйма). Sometimes this sign (×) is substituted by the sign @
- . (point) — the sign is used in decimal fractions and corresponds to the Russian sign , — comma. 2.2 is read two point two (2,2 две целых две десятых)
 - the sign is used in writing dates, hours and minutes (see above). In this case . (point) is not pronounced.
- , (comma) — is used to denote the position of every three numbers: 15,000,000 — fifteen million; 1,000 books — a thousand books.
- : — the sign of ratio and proportion. In this case it is read: "is to". A:B = C:D A is to

B as C is to D.

- :: - the sign denotes the equality of two ratios (proportions) and can be substituted by the sign of equality = $2 : 4 :: 3 : 6$ — two is to four equals (as) three is to six.
- *
- ∴ - the sign means "therefore" — следовательно, поэтому, отсюда
- ∵ - the sign means "since, before" — так как.
- # - the sign has two kinds of nominations:
 - 1) it is the synonym of the abbreviation N., N(s), No (number(s)): # 3 (number three); 2) it means "pound" (фунт, как мера веса), if it stands after the numeral 3 # (three pounds).
- !, \lfloor - these signs in mathematics mean "factorial" $5!$ or $\lfloor 5 = 1 \times 2 \times 3 \times 4 \times 5 = 120$ — five factorial
- \propto - the sign means: to vary proportionally
- +
-
- "
- К
- =
- \neq
-
- /
- $\approx, \text{T}, \text{C}, \text{,}$ - the signs means: approximately equals, is approximately equal to... — приблизительно, почти равен...
- >
- e
- <
- Г
- \geq
- \leq
- 4
- \rightarrow

2	- it means: parallel to — параллельно к...
€	- triangle — треугольник
g	- element of (a set) — элемент (множества)
т	- is not an element of (a set) — не элемент (множества)
q, {}	- is an empty set — пустое множество
l	- intersection — пересечение
c	- union — соединение
c	- subset of — подмножество (чего-то)
⇒	- implies; see — подразумевается, предполагается; смотри, см.
B	- pi [pɔɪ] — B — окружность
r	- [a:r] — radius of circle — радиус круга
Br ²	- pi r squared — Br ² — формула площади круга
0	- belongs to — принадлежит к...
y	- doesn't belong to — не принадлежит к...
d	- is contained — содержится; (a z b) a is not contained in b
e	- contains — содержит
l	- the intersection — пересечение; (A l A' — the intersection of A and A prime)
c	- the union (ACA' the union of A and A prime) — связь, союз
C	- compliment (C _A B — the compliment of B with respect to A) — дополнение
⊥	- perpendicular to — перпендикулярно к...
'	- this sign denotes: 1) minutes — минуты; 2) foot, feet — фут, футы; 3) with numerals expressed by letters a'-prime [eɪ 'pɹɔɪm] — прим.
"	- the sign denotes: 1) second(s) — секунда(ы); 2) inches — дюймы; 3) double prime — два прим, два штриха
'''	- third prime, triple-prime — три штриха
a'''	- a third prime or a triple prime — a три штриха
∫	- the sign of intergral of ... — знак: интеграл от ...
\int_a^b	- the integral between the limits a and b — интеграл в пределах от a до b
≈	- congruent — конгруэнтный
=	

AB	- length of line from A to B — длина линии AB
< >	- broken brackets — скобки угловые
()	- parentheses, round brackets (opening and closing) — круглые скобки
[]	- brackets, square brackets — квадратные скобки
{ }	- braces — фигурные скобки
/ /	- slash brackets — наклонные скобки
°	- degree(s), grade(s) — градус(ы)
0	- null, nought, zero, o [ou] — нуль, ноль, часто читается как алфавитная буква 0 [ou]
%	- per cent — процент
Σ	- the sum, summation of — сумма, знак суммирования
$\sqrt{\quad}, \sqrt[3]{\quad}$	- is called the sign of the root or the radical sign. It is read: square root, cube root — корень квадратный, кубический
$\sqrt[4]{\quad}$	- the fourth root — корень 4-ой степени
$\sqrt[n]{\quad}$	- the n-th root — корень n-ой степени
∅	- diameter — диаметр
", &	- and — и
& c	- etc (etera) — и т.д.; и проч.
F, Б	- circle, circumference — круг, окружность
dy	- differential of y — дифференциал от y
$\frac{dy}{dx}$	- derivative of y with respect to x — обычная производная y по x
$\frac{\partial y}{\partial x}$	- partial derivative of y with respect to x — частная производная y по x
x	- absolute value of (x) — абсолютная величина x
F(x), f(x)	- function of x — функция от x
Єx	- increment of x — приращение x
t°	- temperature — температура
Ⓐ	- at — при, в, по, до (с числительными)
⊘	- centre line — центральная линия, линия центров
μ	- micron — микрон = 0,001 mm (10^{-3} мм)
μm	- millimicron — миллимикрон = 0,001μ (10^{-7} мм)
—	- similar to — подобный

Φ	- equivalent to — эквивалентно (чему-то)
-	- difference — разность
\sphericalangle	- angle — угол
\perp	- right angle — прямой угол
к, с.	- constant — константа
α	- varies (directly, inversely) — изменяется прямо, обратно пропорционально
a_1	- a sub one, a first — а первое
a_n	- a sub n, a n-th — а n-ое (а-энное)
...	- and so on — и так далее
о	- round — круглый
R	- square — квадрат
b	- a 'barred' — "a" с черточкой
г	- 'a' tilted — 'a' с тильдой
a^*	- 'a' star, asterisk — 'a' со звездочкой
\textcircled{a}	- means price or limits of price from ... to (Зр. \textcircled{a} 3.5р.) — символ означает цену или цену в пределах от ... до... (от 3 до 3,5 пенса)
@	- about — около: @ \$ 75.00. & up — около 75 долларов и выше

4. Abbreviations in Mathematics.

A, a, abs — absolute — абсолютный

a. — 1. area — площадь;

2. acre — акр;

3. axis, axes, axial — ось, оси, осевой, аксиальный;

4. angle — угол

a/c, acc. — account — счет

ABC alphabet — основы, алфавит

abv, above — выше, более

AD — Anno Domini — нашей эры

ad — 1. addendum, addenda — дополнение, -я;

2. advertisement — объявление

a.f., as follows — как следует далее
alt.— 1. alteration — изменение;
2. alternate — запасной, другой
A.M., AM, a.m., am — ante meridiem — до полудня
a. m. — above mentioned — вышеупомянутый
amt — amount — число, количество, подсчет
An, an — above named— вышеупомянутый
a. q. — any quantity — любое количество
a o — and others — ... и другие
a. s. f. — and so forth — ... и так далее
aux — auxilliary — вспомогательный
av, avg — average — усредненный, средний
ax — axis, axes — ось, оси
az — azimuth(al) — азимут(альный)
B., b — base — база, основа, основание
b — 1. before — до, перед
2. breadth — ширина
bal — balance — равновесие; остаток, баланс
BC — Before Crist — до нашей эры
BC, bc, c/c — between centres — расстояние между осями
BE — bell end — конец конуса
B/S — both sides — обе стороны; см. на обороте
BS — British Standard — британский стандарт
BR — basic requirements — основные требования
BW — body weight — вес тела
c., cca, cir. — circa — около, приблизительно
c., cc — century, centuries — век, века
C., Cent. — centigrade — Цельсий, по Цельсию
cm — centimetre — сантиметр
c., cb., cu., cub. — cubic, cube — куб(ический)
cb — control button — кнопка управления
csp — correction — поправка

ccw — counterclock wise — против часовой стрелки
 cd — centre distance — расстояние между центрами
 cf — confer — сравни
 CL, cl — centre line — осевая линия, центральная ось
 \cos^{-1} — anticossine — арккосинус
 cos — cosine — косинус
 csc, cosec — cosecant — cosecant
 cot, ctn — cotangent — котангенс
 c to c — centre to centre — расстояние между осями
 C to F — centre to face — расстояние между центром и гранью
 cw — clockwise — по часовой стрелке
 D — пятьсот (римская цифра)
 d — differential — знак "дифференциал"
 D, d — derivative — знак "обычная производная" в символе dy/dx
 ∂ — partial derivative — знак "частная производная" обычно в едином символе $\partial u/\partial x$
 d. — difference — разность
 d. — deci- — деци-...
 d. — distance — расстояние
 d., deg. — degree — градус, степень
 d, dia. — diametre — диаметр
 d — denarius — пенни, пенс
 d — dime — десять центов (США)
 dbl — double — двойной; удвоить
 DC — digital computer — цифровой компьютер
 dc — discrete — дискретный, отдельный
 D.C., d.c., d-c — direct current — постоянный ток
 dh — difference in height — разность высот
 dim — dimension — размер, -мерный
 dist — distance — расстояние
 doz., dz — dozen — дюжина
 dx — duplex — двойной
 et al. — et alii — и другие (авторы)

eq — equal — равный
eqn — equation — уравнение
esp — especially — особенно
est — estimated — расчетный, равный, оцененный
ep — end point — конечная точка
F° — Fahrenheit — фаренгейт (t° шкала)
F, f(x) — function (of x) — функция (от x)
ft — foot, feet — фут(ы)
fig. — figure — рисунок, схема, цифра, чертеж
gl. — gill — джилл (брит.— 0,14 литра; США — 0,12 литра)
GCD, gcd — greatest common divisor — наибольший общий делитель
G.M.T. — Greenwich Mean Time — среднее время по Гринвичу
GZ — ground zero — эпицентр
H, h, ht, hth — height — высота
h — hyper- — гипер-
ha — hectar — га, гектар
HCF, hcf — highest common factor — наибольший общий множитель
h., hr(s) — hour(s) — час(ы)
hwt — hundredweight — центнер (брит. — 50,8 кг., США — 45,3 кг.)
ind — index — показатель
inf — infinity — бесконечность
iv — independent variable — независимая переменная
j — joule — джоуль; знак мнимой величины
K — kelvin — кельвин (t° шкала)
kn — knot — узел, единица скорости
L — left; length; league — левый; длина; лига (мера длины)
lb — libra [laWbrC] — фунт (вес — 454 грамма)
LCM, lcm — least common multiple — наименьшее общее кратное
l — leg — катет
lg — long — длинный
lge, lg — large — большой
lim — limit — предел

lin — linear [lw: nwc] — линейный

log, ln — logarithm, natural l. — логарифм, натуральный л.

log₁₀ — common logarithm — десятичный логарифм

Ltd — limited — ограниченный

M, m — mass — масса

— mega- — мега-

— metre — метр

— micro- — микро

— mile — миля

— milli- — милли-

— minute — минута

— module — модуль

Math, maths — mathematics — математика

max — maximum — максимум

mech — mechanics — механика

min — minimum — минимум

mm — millimetre — миллиметр

mod — module, modulus — модуль

MT — 1. mean time — среднее поясное время

2. metric ton — метрическая тонна

M.T.L. — mass, time, length — масса, время, длина (система единиц)

N, No, no — number (#) — номер, №

nat — natural — натуральное

n. c., nc — no change — без изменений, не изменяя

n.d. — no date — без даты

neg — negative — отрицательный, минусовой

Nos, nos — numbers — номера, №№

nr — near — близ, около, близко

o.c., i.c. — on centres, in centres — между осями, центрами

o.d. — outer diameter — внешний диаметр

opp — opposite — противоположный

oz — ounce [auns] — унция (28,3 грамма)

P., p. — power — степень; мощность, сила

p. — page; part; proton — страница; часть, доля; протон

P/C, p/c — prices current — цены в данный момент
p.c — per cent — процент
p.c. — point of curve — точка, начало кривой
p.d. — per day — на день, в день
per. — period — период
PH, ph — per hour — на час, в час, за час
ph — phase — фаза
pi — point of intersection — точка пересечения
P.M., p.m. — post meridiem — после полудня
pm — per minute — в, за минуту
P of O — point of origin — начало, исходная точка координат
pos., p. — positive — положительный, плюсовой
ps, p.s. — per second — за, в секунду
PT, pt, p — point — точка
pp — pages — страницы
Pr., pr. — Proceedings — труды, ученые записки
pr — pair; primary — пара; первичный, начальный
pt — pint [paʊnt] — пинта
Q.E.D., q.e.d. — quod erat demonstrandum — что и требовалось доказать
q.l. — quantum libet — сколько надо, угодно
qr — quarter — четверть
qt, q. — quantity — количество
R — Reamur — Реомюр (t° шкала)
R., r. — radius, radii; right — радиус(ы); правый; прямой угол
rad. — radical — радикал
Rto, r. — ratio — отношение
rect — rectangular — прямоугольник
rms — root mean square — среднеквадратичный
req — required — требуемый
rev. — reverse — обратный, противоположный
s — second, secondary — секунда, вторичный
s — see — смотри

sc — scale; science — шкала; наука, научный
sec. — secant — секанс
seg. — segment — сегмент
sin — sine — синус
s. l. — straight line — прямая линия
sq., s. — square — квадрат, квадратный
Stg, ster. — sterling — стерлинг
sz — size — размер
T, t — time; temperature — время; температура — t°
tan, tg — tangent — тангенс
tf — true fault — относительная ошибка
ths — thousand — тысяча
tn, t — ton — тонна
TO — turn over — см. на обороте
Trans. — transactions — труды, протоколы ученых
TV — television — телевидение
terminal velocity — предельная скорость
u/k — unknown — неизвестное
u.m. — undermentioned — нижеупомянутый
UFO — unidentified flying object — НЛО, неопознанный летающий объект
val — value — величина, значение
var — variable — переменная
v.v. — vice versa — наоборот
v., vec. — vector — вектор
vers — versine, versed sine — синус-верзус
vs — versus — против, в зависимости от...
wt — weight — вес
w/o — without — без, не
xpen — explanation — объяснение
xi — ex interest — без прибыли
ZF, z.f. — zero frequency — частота нулевого порядка
Z., z. — zero — ноль

zl — zero line — нейтральная ось, нулевая линия

zzz — zigzag — зигзаг

English and American Abbreviations in Metric System of Measure.*

English			Russian		
T	tera	10^{12} units	Т	тера	10^{12} доль, единиц
G	giga	10^9	Г	гига	10^9
M	mega	10^6	М	мега	10^6
K	kilo...	10^3	К	кило...	10^3
h	hecto...	10^2	г	гекто...	10^2
dk	deka...	10	дк	дека...	10
d	deci...	10^{-1}	д	деци...	10^{-1}
c	centi...	10^{-2}	с	сенти...	10^{-2}
m	milli...	10^{-3}	мм	милли...	10^{-3}
μ	micro	10^{-6}	мк	микро	10^{-6}
n	nano...	10^{-9}	н	нано...	10^{-9}
p	pico...	10^{-12}	п	пико...	10^{-12}
f	femto	10^{-15}	ф	фемто	10^{-15}
a	atto...	10^{-18}	а	атто...	10^{-18}

Some of these blends serve as prefixes with quantative meaning:

deca, deka — 10	kilo — 1000	centi — 0,01	myria — 10,000	micro — 0,000001
hecto — 100	deci — 0,1	milli — 0,001	mega — 1,000,000	

Linear Measures — Линейные меры

cm	centimetre	сантиметр	0,01 метра
ch., chn.	chain	чейн	20,12 метра
dm	decimetre	дециметр	0,1 метра
f., ft	foot, feet	фут(ы)	30,48 см
fth	fathom	фадом, фэсом	1,83 метра
fur.	furlong	фурлонг, ферлонг	201,17 метра
i., in.	inch	дюйм	2,54 метра
km	kilometre	километр	1000 метров

* Here the most widely used measures are included.

kn	knot	узел, морская миля	1853,18 метра
L.	leage	лига	≈3 милям или 4,83 км
m	metre	метр	100 см
m., mi	mile	миля	1609,33 метра
mm	millimetre	миллиметр	0,1 см
μ	micron [maʊkrɒn]	микрон	0,001 мм
NM., nm., naut.m.	nautical mile	морская миля, узел	1853,18 м
yd	yard	ярд	91,44 см

Square measures. Меры площади.

a., ac.	acre(s)	акр(ы)	0,4 гектара
Sq. cm	square centimetre(s)	кв. см	0,0001 м ²
Sq. f	square foot	кв. фут	9,29 дм ²
Sq. i.	square inch	кв. дюйм	6,45 см ²
Sq. mi.	square mile	кв. миля	2,59 км ²
Sq. km	square kilometre	кв. км	1 000 000 м ²
Sq. yd.	square yard	кв. ярд	0,836 м ²

Cubic measures. Меры объема.

c.c., cu. c	cubic centimetre	кубический сантиметр	
c.f.	cubic foot	кубический фут	28,32 дм ³
c.m., cu.m	cubic metre	кубический метр	м ³
cm	cubic millimetre	кубический миллиметр	мм ³
c.i., cu. in.	cubic inch	кубический дюйм	16,39 см ³
c. yd, cyd	cubic yard	кубический ярд	764,55 дм ³
reg.t.	register ton	регистрационная тонна	2,83 м ³
cd	cord	корд	3,624 м ³

Cubic measures of liquids and dry substances. Меры объема жидкостей и сыпучих тел.

bl	barrel	баррель	158,98 литров
bu., bsh	bushel	бушель	36,4 литра
gal	gallon	галлон (англ.)	4,55 литра

gl.	gill	галлон (США) джил (англ.) джил (США)	3,785 литра 0,14 литра 0,12 литра
l., lit.	litre	литр	
pt	pint [paʊnt]	пинта	0,57 литра
qr	quarter	квартер	290,94 литра
qt	quart	кварта	1,14 литра

Weight measures. Меры веса.

dr	dram	драхма	1,77 г
gr	gramme	грамм	0,001 кг
hwt	hundredweight	хандредвейт	50,8 кг
kg	kilogramme	килограмм	1000 г
lb	pound	фунт	453,6 г
qr.	quarter	квартер	12,7 кг
st	stone	стон	6,35 кг
t., tn.	ton	тонна большая	1016,048 кг
oz	ounce [auns]	унция	28,35 г

Angles. Углы.

4 right angles = 1 circle, 360 degrees — 360°.

1 right angle = 90 degrees — 90°.

1° (degree) = 60 minutes, 60'.

1' (minute) = 60 seconds, 60".

Temperature.

We usually take temperature with Celsius scale (Centigrade). In Great Britain and USA the temperature is usually taken (measured) with Fahrenheit scale; according to it water boils at 212° and freezes at 32°. Thus, to go over from Fahrenheit scale to Celsius thermometer — Centigrade, it is necessary to know the following formula:

$$^{\circ}C = \frac{(^{\circ}F - 32)5}{9} \quad \text{and v.v.} \quad F = C \cdot \frac{9}{5} + 32$$

There are three other scales for measuring temperature: Reaumur's, Kelvin's and Rankine's ones, but they are not widely used. All thermometers are similar but with different scales. For daily civil purposes Fahrenheit and Celsius scales are more convenient, for technical and scientific measurements Rankine and Kelvin scales are in use.

The ratio of temperature units of the most frequently used scales is as following:

$$\text{Fahrenheit } t_F = \frac{9t_C}{5} + 32 = \frac{9t_R}{4} + 32$$

$$\text{Reaumur } t_R = \frac{4(t_C)}{5} = \frac{4(t_F - 32)}{9}$$

$$\text{Celsius } t_C = \frac{5(t_F - 32)}{9} = \frac{5t_R}{4}$$

To convert F°t into C°t: subtract 32 and multiply by 5/9;

to convert C°t into F°t: multiply by 9/5 and add 32;

to convert R°t into K°t the F°t scale is changed into C°t scale and then to Kelvin°.

F → C → K

R → C → K

	Fahrenheit (F)	Centigrade (C)
Boiling point	212°	100°
	194°	90°
	176°	80°
	158°	70°
	140°	60°
	122°	50°
	104°	40°
	86°	30°
	68°	20°
	50°	10°
	Freezing point	32°
14°		-10°
0°		-17.8°
Absolute Zero	-457.67°	-273.15°

Addition. Сложение.

$a+b=c$ is read: a plus b equals c ; a and b is equal to c ; a added to b makes c ;
 a plus b is c .

a , b are called "addends" or "summands" (слагаемые); c is the "sum".

Subtraction. Вычитание.

$4-3=1$ is read: three from four is one; four minus three is one; four minus three is equal to one; four minus three makes one; the difference between four and three is one; three from four leave(s) one.

4 is called "a minuend" (уменьшаемое); 3 is "a subtrahend" (вычитаемое);

1 is "a difference" (разность).

Multiplication. Умножение.

$2 \times 3 = 6$; $2 \cdot 3 = 6$ is read: two multiplied by three is six; twice three is six; three times two is six; two times three make(s) six.

$5 \cdot 3 = 15$ five threes is (are) fifteen

2, 5 are "multiplicands" (множимое); 3 is "a multiplier" / "factor" (множитель); 6 is "a product".

Division. Деление.

$35 \div 5 = 7$ is read: thirty five divided by five is 7; five into thirty five goes seven times; 35 divided by 5 equals 7.

35 is "a dividend" (делимое); 5 is "a divisor" (делитель); 7 is "a quotient" (частное).

Involution or Raise to power. Возведение в степень.

3^2 , 5^3 are read: three to the second power or 3 squared; five cubed or 5 to the third power (to power three).

x^2 — x is called the "base of the power"; 2 is called "an exponent or index of the power".

Evolution. Извлечение из корня.

$\sqrt{9} = 3$ is read: the square root of nine is three.

$\sqrt[3]{27} = 3$ is read: the cube root of twenty seven is three.

$\sqrt{\quad}$ is called "the radical sign" or "the sign of the root".

to extract the root of ... — извлекать корень из...

Fractions. Дроби.

Common fractions. Простые дроби.

Common (simple, vulgar) fractions nowadays more often than not are written on one line: $1/2$, $5\ 3/5$, $4/7$, $1/3$ in printing. But there are printed works where traditional writing is used:

$\frac{5}{7}$, $\frac{4}{8}$, $3\ \frac{5}{8}$ etc.

Common fractions are read in the same way as we, Russians do, i. e.: the numerator is read as a cardinal number and the denominator as an ordinal number. If the numerator is greater than one the nominator takes the plural ending -s: $3/7$ — three sevenths, $5/8$ — five eighths etc.

In mixed numbers the integer is read as a cardinal number and fraction must be added with "and". E. g.: $3\ 2/5$: three and two fifths; $10\ 2/7$: ten and two sevenths.

The reading of small fractions is often simplified: $1/2$ is read a half, one half, $1/3$ — a third, $1/4$ — a quarter; instead of: one the second, one the third, one the fourth.

Decimal fractions. Десятичные дроби.

In decimal fractions the point (.) is used after the whole number in distinction from Russian, where comma (,) is used and where this sign is not read. But in Russian we must always say — десятых, сотых, тысячных и т. д., in English it is suffice to write (.) and to say "point": 0.5 — nought [n]:t] or O [ou] point five or .5 — point five; 1.3 — one point three; 10.35 — ten point three five; 5.253 — five point two five three; 0.001 — point OO one, or point nought nought one; point two noughts one; point two Oes one.

After the point (.) all numbers are read separately.

Nought, O may often be omitted but the point (.) is never omitted because it shows that the number is a decimal fraction. In the USA "O" is preferred to be read as "zero".

The point (.) may be written in the upper, middle or down part of the decimal fraction: 2.5; 2·5; 2*5.

Ratio. Отношение.

$a : b$ is read: the ratio of a to b ; $10 : 5$ is read: the ratio of *ten* to *five*;

$4 : 2 = 2$: the ratio of four to two is two.

$\frac{20}{5} = \frac{16}{4}$: the ratio of twenty to five equals the ratio of sixteen to four; twenty is to five as sixteen is to four.

Proportion. Пропорция.

In proportion we have two equal ratios. The equality is expressed by the sign $::$ which may be substituted by the international sign of equality $=$.

$a : b :: c : d$ or $a : b = c : d$ — is read: a is to b as c is to d ;

$2 : 3 :: 4 : 6$ or $2 : 3 = 4 : 6$ — is read: *two* is to *three* as *four* is to *six*.

The extreme terms of proportion are called "extremes", the mean terms are called "means". The proportion can vary directly (изменяться прямо пропорционально) and it can vary inversely (изменяться обратно пропорционально):

$x \propto y$: x varies directly as y ; x is directly proportional to y ;

$x = k/y$: x varies inversely as y ; x is inversely proportional to y .

Equations and Identities. Уравнения и тождества.

There are different kinds of equations. In general the equation is an equality with one or several unknown variable(s). The reading of equations is the same as in Russian:

$30 + 15 + x^2 + x^3 = 90$ — is read: thirty plus fifteen plus x squared plus x cubed is equal to ninety.

$2 + b + \sqrt{6 + b^4} = 160$ — is read: two plus b plus *the square root of six plus b to the fourth power* is equal one hundred and sixty.

The identity is an equality, valid at all admissible values of its variables.

The identities are read:

$a + b = b + a$ — a plus b equals b plus a ;

$\sin^2 x + \cos^2 x = 1$ — *sine squared x plus cosine squared x* is equal to one.

Arithmetical and Geometrical Progressions.

Арифметическая и геометрическая прогрессии.

An arithmetical progression is a sequence such as 3, 5, 7, 9 ..., in which each member differs from the one in front of it by the same amount.

A geometrical progression is a sequence such as 3, 6, 12, 24 ..., in which each member differs from the one in the same ratio. "The number of families holidaying abroad grew now in geometrical progression".

Mathematicians more often use now the expressions *arithmetic sequence* and *geometric sequence*.

Reading formulae. Чтение формул.

$a \div b = c$	a divided by b is equal to c
$2 \times 2 = 4$	twice two is four
$c \times d = b$	c multiplied by d equals b
dx	differential of x
$\frac{a+b}{a-b} = \frac{c+d}{c-d}$	a plus b over a minus b is equal to c plus d over c minus d
$y_{a-b} \cdot x_{b-c} = 0$	y sub a minus b multiplied by x sub b minus c is equal to zero
$\frac{d^2 y}{ds^2} + [1 + b(s)]y = 0$	the second derivative of y with respect to s plus y times open bracket <i>one plus b of s in parentheses</i> , close bracket is equal to zero
$\int f(x) dx$	the integral of $f(x)$ with respect to x

$$\int_a^b f(x) dx$$

$$c(s) = K_{ab}$$

$$x_{a-b} = c$$

$$a \propto b$$

$$a : b :: c : d;$$

$$a : b = c : d$$

$$x \times 6 = 42$$

$$10 \div 2 = 5$$

$$\frac{a^2}{c} = b$$

$$a^5 = c$$

$$\frac{a+b}{a-b} = c$$

$$a^3 = \log_c b$$

$$\log_a b = c$$

$$x_{a-b} = c$$

$$\frac{\partial^2 u}{\partial t^2} = 0$$

$$c : d = e : l$$

$$15 : 3 = 45 : 9$$

$$p \approx \sum_{i=0}^{n-1} f(x_i) \Delta x$$

$$|\sqrt{a^2+b^2} - \sqrt{a^2+b_1^2}| \leq |b - b_1|$$

$$a^{z_n} \leq \lim_{n \rightarrow \infty} a^{z_n}$$

$$\sum_{j=1}^n a_j; j = 1, 2, \dots, n$$

the definite integral of $f(x)$ with respect to x from a to b (between limits a and b)

c of s is equal to K sub ab

x sub a minus b is equal to c

a varies directly as b

a is to b as (equals) c is to d

x times six is forty two; x multiplied by six is forty two

ten divided by two is equal to five; ten over two is five

a squared over c equals b

a raised to the fifth power is c ; a to the fifth degree is equal to c

a plus b over a minus b is equal to c

a cubed is equal to the logarithm of b to the base c

the logarithm of b to the base a is equal to c

x sub a minus b is equal to c

the second partial derivative of u with respect to t equals zero

c is to d as e is to l

fifteen is to three as forty five is to nine; the ratio of fifteen to three is equal to the ratio of forty five to nine

p is approximately equal to the sum of x sub i delta x sub i and it changes from zero to n minus one

the square root of a squared plus b squared minus the square root of a squared plus b sub one squared by absolute value is less or equal to b minus b sub one by absolute value (by modulus)

a to the power z sub n is less or equal to the limit a to the power z sub n where n tends (approaches) the infinity

The sum of n terms a sub j , where j runs from 1 to n

${}^4\sqrt{81} = 3$	The fourth root of 81 is equal to three
$c \propto d$	c varies directly as d
$\sin \alpha = a$	Sine angle α is equal to a
$\int \frac{dx}{\sqrt{a^2 - x^2}}$	Integral of dx divided by (over) the square root out of a square minus x square
$\frac{d}{dy} \int_{x_0}^x x_{dx}$	d over dx of the integral from x sub 0 to x of capital x_{dx}

Addenda. Приложение.

Latin / Greek singular and plural forms of some mathematical terms.

Латинские / греческие формы единственного и множественного числа
некоторых математических терминов.

ед. ч. sing.	мн. ч. plur.		
- is	- es	axis - axes	ось - оси
[ws]	[w:z]	analysis - analyses	анализ - анализы
		hypothesis - hypotheses	гипотеза - гипотезы
		parenthesis - parentheses	скобка-скобки
		thesis - theses	тезис, диссертация - тезисы, диссертации
		basis - bases	база, основание - базы, основания,
- a	- ae	formula - formulae	формула - формулы
[c]	[aw]	lamina - laminae	тонкая пластинка - тонкие пластинки
- us	- i	syllabus - syllabi	программа - программы
[cs]	[aw]	locus - loci [lousaw]	геом.: место точек, траектория - траектории
		nucleus - nuclei	ядро - ядра
		radius - radii	радиус - радиусы
		focus - foci	фокус - фокусы
		modulus - moduli	модуль - модули
		genius - genii; geniuses	гений - гении; демон - демоны
		stimulus - stimuli	стимул - стимулы
- on	- a	criterion - criteria	критерий - критерии
[n]	[c]	phenomenon - phenomena	явление - явления
		polyhedron - polyhedra	многогранник - многогранники
-um	- a	datum - data	данное - данные
[m]	[c]	momentum - momenta	момент - моменты
		quantum - quanta	квант - кванты
		maximum - maxima	максимум - максимумы
		minimum - minima	минимум - минимумы
		erratum - errata	ошибка - ошибки
		symposium - symposia	симпозиум - симпозиумы
		spectrum - spectra	спектр - спектры
		medium - media	середина - середины

		corrigendum - corrigenda	опечатка, поправка - опечатки, поправки
- x	- ces	matrix - matrices	матрица - матрицы
[ks]	[sw:z]	radix - radices	основание, корень - корни
		vertex - vertices	вершина - вершины
		index - indices	показатель - показатели
		appendix - appendices	приложение - приложения
		helix - helices	спираль - спирали

Reading Proper Names. Чтение собственных имен.

Alexander J. W.	[Flwɔg 'zandɔ]	Александр, Джеймс	1888-1971
Ampere A. M.	['Fmpɛs]	Ампер А.М.	1775-1836
Abel N.	[ɛwbl], [ɑ:bɔl]	Абель Н.	1802-1829
Archimedes	[ɑ:kw 'mwdwz]	Архимед	287-212 BC
Avogadro A.	[Fvɔ 'gɑ:drou]	Авогадро А.	1776-1856
Aristotle	['Frwst]tl]	Аристотель	384-322 BC
Bardeen J.	[bɑ: 'dw:n]	Бардин, Джон	1908-
Bessel F.T.	['besɔl]	Бессель, Фридрих	1784-1846
Bolyai J.	[b]lew]	Бойаи (Больяй) Янош	1802-1860
Berkley J.	[bɑ:klw]	Беркли Дж.	1685-1753
Bernoulli J.	[bɔ:nu:lw]	Бернулли Я.	1654-1705
Brewster, Sir David	[bru:stɔ]	Брустер, сэр Дэвид	1781-1868
Cauchy A.L.	[k]:•w]	Коши, Огюстен	1789-1857
Clifford W.S.	['klwfd]	Клиффорд, Уильям	1845-1879
Copernicus N.	[kou 'pɔ:nwks]	Коперник Н.	1473-1543
Coulomb Ch.	['ku:l]:m]	Кулон, Шарль	1736-1806
Crelle A.L.	['krelɔ]	Крелль Август	1780-1855
Curie M.	[kju: 'rw:]	Кюри, Мария	1867-1934
Davy H.	[dɛwvw]	Дэви Х.	1778-1829
De Broglie L.	[dɔ 'br]wlv]	Бройль (де Бройль) Л.	1892-1958
Dedekind Y.W.	['dedɔkwnd]	Дедекиннд Юлиус	1831-1916
Demokritos	[dw 'm]krɔts]	Демокрит	.470 BC
Descartes R.	[dɛw 'kɑ:t]	Декарт Р.	1596-1650
Diophantes	[daw] 'fɛnts]	Диофант	III в.
Dirac P.	[dw 'rFk]	Дирак П.	1902
Dirichlet P.G.	[dwrwk 'le]	Дирихле Петер	1805-1859
Einstein A.	['aɪnstawɪn]	Эйнштейн А.	1879-1955
Eisenstein F.M.	[, aɪzɛnstaɪn]	Эйзенштейн Ф.	1823-1852
Empedocles	[em 'pedɔklw:z]	Эмпедокл	490-430 BC
Epicurus	[ɛpw 'kju:krɔs]	Эпикур	341-270 BC

Eudoxus	[ju: 'd]kscs]	Евдокс	408-355 BC
Euclid	[ju:klwd]	Эвклид, Евклид	III в. BC
Euler L.	['jwlcɹ,]wlc]	Эйлер Л.	1707-1783
Fahrenheit G.	['fFrɯnhawt]	Фаренгейт М.	1686-1736
Faraday M.	['fFrɯcdw]	Фарадей М.	1791-1867
Fermat P.	[, fɯ 'mɑ:, fermɑ:]	Фермб, Пьер	1601-1665
Fermi E.	[, fɯ 'mw:, fermw:]	Ферми Э.	1901-1954
Foucault	[fu:kou]	Фуко	1819-1868
Fourier J.B.	[fu 'rwc:]	Фурье Ж.Б.	1768-1830
Galilei G.	['gFlwlv]	Галилей Г.	1564-1642
Gauss C.	[gɑ:us; gFus]	Гаусс К.	1777-1855
Galois E.	[gɯlu 'ɑ:]	Галуа, Эварист	1811-1832
Geiger H.	[gɑwɯgɯ]	Гейгер Х.	1882-1945
Germain	['ɟer 'mɯ:n]	Жермен Софи	1776-1831
Gielbert W.	['gvlbɯt]	Гильберт У.	1544-1603
G�del K.	[gɯ:dɯl]	Г�дель К.	1906-1978
Gregory J.	['gregɯrɯ]	Грегори Дж.	1638-1678
Hamilton W.R.	['hFmwltɯn]	Гамильтон, Уильям	1805-1865
Hilbert D.	['hwlvɯt]	Гильберт Д.	1862-1943
Heisenberg V.	['hɑwznɯɯ:g]	Гейзенберг В.	1901-1976
Hippocrates	[hw 'p]krɯtw:z]	Гиппократ	V в. BC
Huygens E.	['hɑwɯgenz]	Гюйгенс Э.	1629-1695
Joule J.	[�u:l]	Джоуль Дж.	1818-1889
Kelvin W.	['kelvɯn]	Кельвин, Томсон У.	1824-1907
Khayyam Omar	[kɑw 'jam 'oumɑ:]	Хайям Омар	1048-1123
Lagrange J.L.	[lc 'grɑ:nɟ]	Лагранж Жозеф	1736-1813
Laplace P.S.	[lc 'plɑ:s]	Лаплас Пьер	1749-1827
Legendre A.M.	[lc 'ɟɑ:nɟ]	Лежандр Адриен	1752-1833
Leibniz G.W.	[lɑwbnwz]	Лейбниц Готфрид	1646-1716
Lucretius	[lu: 'krw:�cs]	Лукреций	I в.С.
Maclaurin	[mɯk 'l]:rwn]	Маклорен К.	1698-1748

Maxwell J.C.	[mFkswcl]	Максвелл Дж.	1831-1879
Mercater G.	[mc 'kewtc]	Меркатор Герард	1512-1594
Monge G.	[m]:nΓ]	Монж Гаспар	1746-1818
Napier J.	[' newpwc, nc 'pwc]	Непер Дж.	1550-1617
Piazzi G.	[pw 'α:scw]	Пиаци Джозеппе	1746-1826
Picard E.	[pw 'kα:]	Пикард Эмиль	1856-1941
Plato	['plewtou]	Платон	428-348 BC
Poincare J.H.	[' pwa:nkare]	Пуанкаре Ж.А.	1854-1912
Ptolemy Claudius	['t]lwmw kl]:djcs]	Птолемей Клавдий	-9-160 AD
Pythagoras	[paw 'ʏFɔCɾCs]	Пифагор	570-500 AD
Pythagorean	[paw, ʏFɔC 'rw:cn]	пифагорийский	
Ramanujan S.	[rc, mcnc 'ʔen]	Рамганужан Ш.	1887-1920
Riemann B.	[' rw:mcn]	Риман Б.	1826-1866
Saccheri Girolamo	[sc 'ʔerw ʔwrc 'lewmu]	Саккери Джароламо	1667-1733
Simpson T.	[swmpsn]	Симпсон Т.	1710-1761
Socrates	[s]krctw:z, souk...]	Сократ	470-399 BC
Syracuse	[' sawCrckju:z]	Сиракузы	
Taylor B.	[tewlc]	Тейлор Б.	1685-1731
Torricelli	[t]rw 'ʔelw]	Торричелли	1608-1647
Thales	[ʔewlw:z]	Фалес Милетский	624-548 BC
Wiener N.	[ww:nC]	Винер Норберт	1894-1964
Weierstrass K.	[' wawCstrCs]	Вейерштрасс Карл	1815-1897

It is interesting to know

1. Pythagoras of Samos (570-500 BC) opened a philosophy school where a number was considered as being the «essence» of all things and the Universe — as harmonic system of numbers and their relations with each other.

Pythagoreans distributed all numbers into classes: even and odd, prime and compound, perfect, friendly, harmonic, triangle, quadratic and pentagonal etc. Figure «one» was assumed to be deity, reason, good, harmony, luck. Figures "1", "2", "3", "4" were taken as fundamental, "5" was the symbol of a happy unit (marriage) because it was the sum of the first even and odd numbers (excluding 1 as the basis of all numbers). "6" was the symbol of soul, as it was the first perfect number and its divisors' sum ($1+2+3$) was equal to the number itself. Figure "7" symbolized health and "8" was the symbol of love and friendship.

Number "36" embodies the whole world that surrounded us, because 36 presented the sum of the first even ($2+4+6+8$) and the first odd ($1+3+5+7$) numbers and that these figures constituted the Universe.

2. Geometry emerged in Egypt where the peasants had to measure land plots, whose borders were washed away by the Nile's over-flows.

3. Geometry as a science appeared in Greece after the Egyptian practical notions in geometry had penetrated there. Greek scientists and philosophers such as Thales, Democritus, Pythagoras, Euclid developed geometry into a strict harmonious mathematical theory.

4. Every proved theorem in geometry serves as an axiom in subsequent proofs.

5. The word "algebra" originated in Arabian language (aljebr) and it meant — "reunion of broken parts" — воссоздание, воссоединение разрозненных частей.

6. Omar Khayym, the famous Eastern poet, philosopher, astronomer and mathematician considered algebra to be "the scientific art".

Omar Khayym's mathematical calculations in composing Calendar were taken into account by the French to compile the revolutionary calendar in the late XVIII century.

7. It was Democritus who was the first to compute infinitesimal quantities.

8. One metre was chosen as an International standard in measuring linear segment units as a measure almost equal to $1/40,000,000$ th part of the terrestrial meridian.

9. P.Fermat (1601-1665) was a lawyer, mathematics being his hobby. But he became famous due to mathematics. He is considered to be the founder of Analytical geometry and Theory of Numbers.

10. Fermat's theorem (or Great Theorem), which postulates: "there do not exist three whole numbers x, y, z where the equality $x^n+y^n=z^n$ would be implemented if $n > 2$ " has not been proved in its general form up till now.

11. The formula to define the Sunday when the Orthodox Easter comes according to the Gregorian Calendar was introduced by an outstanding German mathematician Gauss K.F. (1777-1855). His formula works and is valid for the past, present and future.

12. The greater early painters Raphael, Michelangelo, Leonardo da Vinci based their works on geometric principles.

13. Sculpture, architecture, painting are all based on using geometric forms and proportions and even in ancient times they were taken into account in determining the proportions of famous buildings: the Parthenon, the Acropolis in Athens, triumphal arches and Gothic cathedrals.

14. Euclid's "Elements", written more than 2000 years ago is still used in Great Britain as a textbook on geometry.

15. Gödel K. — an Austrian-born (1906-1978) famous USA logician and mathematician presented a page of symbols that purports to be a rigorous proof for the existence of God. This latter is a recasting of the notorious "Ontological Argument" for God's existence into the language of mathematical logic. He established first the "theorem" — $M(\exists x) G(x) \supset N(\exists y) G(y)$ — which says that, if God's existence is possible, then it is necessary, and then argues that God's existence is indeed possible. Therefore, necessarily, God exists.

16. Rene Decartes, the famous mathematician (1596-1650) did not accept imaginary numbers and it was not surprising that he flatly rejected them in his mathematical investigations.

17. Galileo once remarked, that the great book of nature is written in the language of mathematics.

18. The first Russian woman-mathematician S.Kovalevskaya became famous not in Russia but in Göttingen University where she had supported for her Doctoral thesis.

19. The word "cybernetics" appeared in American English in 1946. This word was coined by the founder of cybernetics Norbert Wiener (1894-1964) from two Greek blends and it

meant «наука управления». This word had existed in Plato's work — Dialogues, but its meaning had been "the art of navigation".

20. Almost all terms connected with cybernetics and computing technique in Russian are of English origin because cybernetics was not admitted as science in the Soviet Union during many years and when at last it was recognized all the terms were taken-ready by the Russian language of this branch of science.

21. The first woman president of the American Economic Association is now in office (1996). Joan Robinson of Cambridge University was acknowledged as one the great 20-th century economists even by her (male) enemies. Brady and Schwartz can be counted as founders of quantitative economic history. But in general famous women in mathematics and economy are rare and it is explained by the fact (in the previous ages and later up till 1960) of the then existing misogyny [maw 's]@wnw] in sciences. This trend got the title "Great American Gender Reaction" in the USA.

22. Professor Garrow (London) said that the modern ideal woman favoured by clothes designers and fashion editors was physiologically underweight. "Models with a BMI of less than 18 are thinner than it is healthy to be". BMI (Body-Mass-Index) is calculated by measuring weight against height: kilograms divided by metres squared — kg/m^2 . A woman 5 ft 8 in. tall weighing 11 stone has a BMI of 23.3. Every woman of that height with a weight from just under 9 stone to just over 12 stone would fall within the normal BMI range of 20 to 25. Professor Garrow said: "If your BMI is between 20 and 25 for God's sake worry about something else, not your weight".

23. Hilbert David, a great German mathematician was born in Königsberg in 1862. He was the first to reduce geometry to a series of axioms and to contribute substantially to the establishment of the formalistic foundations of mathematics. Due to these foundations the development of mathematics and logic after Hilbert was different from the previous one. The city of Königsberg in 1930 made Hilbert an honorary citizen. Hilbert is known to be one of the greatest and most versatile mathematicians of his time.

24. Jules Henri Poincare the prominent French mathematician, astronomer and philosopher of science emphasized the subconscious, while probing the psychology of mathematical discovery and invention. He was a forerunner of the modern intuitionist school and he believed, that sudden illumination, following long subconscious work, was a prelude to mathematical creation.

25. Norbert Wiener, the founder of cybernetics, wrote that Chalmogorov's thoughts were the same as his ideas and he knew that Chalmogorov had independently analysed some principal questions in mathematics connected with cybernetics and had been the first to publish the results. Wiener also mentioned many Russian mathematicians in his books with the only aim — to attract attention to his new ideas. But he could not imagine the impression and exitation his ideas had made upon the scientists all over the world!

26. John Leslie, a professor of philosophy tried to estimate the probabilities of the end of the world, the Apocalypse. His list is rather sobering: Risks already well recognized: 1. Nuclear war. 2. Biological warfare. 3. Chemical warfare. 4. Destruction of the ozone layer. 5. Greenhouse effect. 6. Poisoning by pollution. 7. Disease. Risks often unrecognized — Group First: Natural disasters — 1. Volcanic eruptions. 2. Hits by asteroids and comets. 3. Extreme ice age due to passage through an interstellar cloud. 4. Nearby supernova. 5. Other massive astronomical explosions. 6. Essentially unpredictable breakdown of a complex system. 7. Something-we-know-not-what. Group Two: Manmade disasters: 1. Unwillingness to rear children. 2. Disaster from genetic engineering. 3. Disaster from nanotechnology. 4. Disasters connected with computers. 5. Disaster from some other branch of technology, perhaps just agricultural which had become crucial to human survival. 6. Production of a new big bang in the laboratory. 7. Possible production of an alldestroying phase transition. 8. Annihilation by extraterrestrials. 9. Something-we-know-not-what. Risks from philosophy. These include: threats associated with religions; Schopenhauerian pessimism; negative utilitarianism; and the prisoner's dilemma (The Times Higher, 13.09.1996.).

27. Benjamin Franklin (1706-1790) an outstanding American politician and scientist was the first to introduce the terms "plus", "minus", "positive", "negative" electricity. He invented devices known as "battery" and "lightening-rod".

List of terms and expressions.

The list given below consists of words and expressions difficult for translating from English into Russian and vice versa.

Sometimes they are words familiar with commonly used ones (leg — нога; belief — вера; biased — предубежденный; both — оба, etc.) or words with terminological meanings (artificial numbers — логарифмы) or prepositions, adverbs or phraseological units where the students and post-graduates make bad mistakes.

A one, A1	первоклассный
according to	в соответствии
adjoining leg	прилежащий катет
all the more	тем более
all the same	все равно
all one	все равно
angular minute	угловая минута
alternate angles	накрест лежащие углы
artificial numbers	логарифмы
as if, as though	как будто, как если бы
as it were	как бы; так сказать
as of (1945)	по данным на 1945 г.
as often as not	нередко
(in) as much as	поскольку, ввиду того, что
as per	согласно
as-proved	в том виде как доказано
at any rate	по крайней мере
at randon	наугад
backward difference	разность назад
bank of a cut	граница разреза
be of value (importance)	иметь значение
bear in mind	хранить в уме, помнить
because of	из-за, вследствие, поскольку

belief line	доверительная вероятность
be soluble	являться, быть разрешимой
beyond	вне, за
he is beyond me	он знает больше меня
at the far of beyond	у черта на куличках
biased estimate	оценка смещения
both ... and	как ... так и
break point	точка излома
broken brackets	угловые скобки
by means of	посредством, при помощи
by no means	никоим образом
case in hand	рассматриваемый случай
in case	если
in the case of	в случае
in any case	во всяком случае
the case is	дело в том, что
in no case	ни в коем случае
cardinal (number), power	кардинальное число; мощность множества
centesimal minute	минута метрическая (угла)
close second	почти первый (в чем-либо)
computer oriented	связанный с компьютером
continuous mapping	непрерывный оператор
contracting mapping theorem	принцип сжимающих отображений
convert into	превращать в ...
convex programming	выпуклое программирование
coprime numbers	взаимно, попарно простые числа
crash problem	срочная программа
cusp, caspidal point	точка возврата
dashed, dotted line	пунктирная линия ----- ,
debug the system	убрать ошибки из системы (комп.)
decimal	десятичная дробь

a repeating d.	периодическая дробь
depend on, upon	зависеть от
due	во-время, должный
due to	благодаря (чему-то, кому-то), вследствие
dwell upon, on	остановиться (на чем-то), рассказать
essence	суть, истина
The very essence	истинная суть
even number	четное число
even money	круглая сумма
evenly even	кратный четырем
unevenly even	кратный двум, но не кратный четырем
even so	даже, если это так
even though	даже, если
ever increasing	все возрастающий
if ever	если это может быть вообще
hardly ever	редко, почти никогда, едва ли
fly off at a tangent	отойти от главного, от темы
far cry	большое расстояние, большая разница
far from	далеко не ...
few and far	мало и редко
first things first	сначала главное
for	так как
for all that	несмотря на это
for granted	без доказательства
for one	например
for once	на этот раз, однажды
for the sake	ради (чего-либо)
gem of arithmetic	жемчужина математики, «золотая теорема»
generalities	общие замечания
generally recognized	общепризнанный
get rid of	избежать (чего-то), отделаться
granting, granted	допустим, что ...

half as high	в два раза ниже
half as large / much	в два раза меньше
hard	много, усиленно (что-то делать); трудный, тяжелый
hardly	едва; еле-еле; вряд ли
to have nothing to do	не иметь ничего общего
highlight	основной факт, момент
if and only if	тогда и только тогда
if any, if at all, if ever,	если вообще (имеет место)
if so	если да; если так
in any case	во всяком случае
inasmuch	поскольку; ввиду того, что
in order to / for	для того, чтобы
in question	рассматриваемый, исследуемый
in terms of	в смысле, при условии, за счет, в каких-то единицах; в понятиях; в плане; в виде; на основе
know-how	справочник, опыт, инструкция
last but one	предпоследний
let alone	не говоря уже о ...
(as) little as	только, до (перед цифрами)
likelihood function	функция (правдоподобная, правдоподобия)
Möbius band, strip	лист Мёбиуса
make sense	иметь смысл
make a report	сделать доклад
malfunction	искажать; неисправность
marginal concept	решающая концепция
more often than not	нередко
(the) more so	тем более, что
moreover	кроме того, более того
most directly	сразу
most probably	вероятнее всего
neither ... nor	ни ... ни

no longer	больше не ...
nodal singularity, knot	узел
not at all	нисколько, вовсе нет
non-intersecting sets	непересекающиеся множества
n-tuple root	n-кратный корень
null and void	недействительный, аннулированный
a number of	немного, несколько, некоторые
the numbers of	масса, много
in numbers	в большом количестве
"Number "3", "8", "13""	(жарг.) названия наркотиков
(Smb's) number is up	чья-то песенка спета, ему крышка
Number of the beast	(библ.) 666 - число зверя
odd	нечетный, лишний, добавочный, случайный
odds	неравенство, излишки
on account of	вследствие, из-за
on no account	ни в коем случае
only	только
the only	единственный
on the one / other hand	с одной / другой стороны
opinions differ	мнения расходятся; о вкусах не спорят
other than	кроме
owing to	из-за, в связи с, благодаря
over the range	в диапазоне, в пределах
out of order	в беспорядке
pagoda	запись
par excellence	преимущественно
partial equation	уравнение в частных производных
pay attention to	обратить внимание на ...
place the limit	установить предел
place over	помещать над ... (чертой, буквой)
put forward	выдвинуть (теорию)

proceed from	исходить из
~ to	приступать к
proceedings	труды (ученого общества), протоколы, записки
put into practice	вводить в практику
question	вопрос
to beg the question	считать вопрос решенным
in question	искомый, рассматриваемый
out of the question	не может быть и речи
raise to the power	возводить в степень
ranging from ... to	в пределах от ... до
reasoning from this	исходя из этого, рассуждая по поводу
regarding / regardless	относительно / независимо от
result	происходить в результате
result in	иметь в результате
result from	быть следствием от
Roentgen rays ['r]ntjcn]	X-лучи, рентгеновские лучи
root mean square	среднеквадратичное значение
running	подряд
sampled	дискретный
save and except; save for	за исключением, не считая
scale down	сводить к одному / определенному масштабу
score(s)	счет; множество; два десятка
seeing	поскольку
set up	учредить
~ aside	отложить, не учитывать
~ forth	выдвигать, излагать
~ to	приступать
singlevalued	однозначный
short cuts	правила делимости
so much as	столько, как; даже
so much so	до такой степени; так, что
solid line	сплошная линия

solid angle	телесный угол
subject matter	основная тема, предмет обсуждения
subject to	в соответствии; допуская, если
take for granted	считать доказанным, принимать без доказательства
take into account	принимать в расчет
take place	иметь место, происходить
take the floor	взять слово, иметь слово
thanks to	вследствие
that is why	вот почему
theorema aureum (лат.)	«золотая теорема»
the ... the	чем ..., тем
thereby	тем самым
therein	в нем, в ней, там
thus far	до сих пор, пока
three times	умноженный на 3, в три раза больше, трижды
thrice	трижды
to a lesser extent	в меньшей степени
twice as good	вдвое лучше
twice as little	вдвое меньше
twice as much / large	вдвое больше
two by four	2×4; мелкий, незначительный
in two twos	в два счета, немедленно
two upon ten	смотри в оба, чтобы (10 пальцев) не взяли (укра- ли)
to be explicit	чтобы было яснее, понятнее
under way	в работе; осуществляемый сейчас
unequivocal	определенный
unlikely	маловероятно
unlooped	несамопересекающаяся (прямая)
untenable	несостоятельный
vain; in vain	напрасный, напрасно, тщетно
valid	действительный, правильный

value	значение; величина
vanish	стремиться к нулю
variety of	целый ряд, множество (чего-то)
virtue	свойство
by (in) virtue of	посредством, в силу чего-то
wake	след, кильватер
in the wake of	вслед за (кем то)
want	недостаток, отсутствие, необходимость
for want of	из-за отсутствия
way	путь, способ; образ действия
by way of	с целью, через, посредством
either way round	любым путем
in a way	до некоторой степени
in a rough way	приблизительно, при грубом подсчете
in no way	никоим образом
the other way (round)	иначе (наоборот)
well	вполне, значительно, как раз
well above / over	значительно выше, больше
as well (as)	также и; также как и
whatsoever	вообще, совсем
whence	откуда
whereby	тем самым, посредством чего
whether ... or	или ... или; независимо от
whether it be	будь то
yet	еще, все еще; тем не менее, однако
as yet	все еще, пока
not yet	еще не

ИСПОЛЬЗОВАННАЯ ЛИТЕРАТУРА:

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