

Mathematical expressions

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I. Introduction

How to use the words “number”, “figure”, “digit”, and “numeral”?

NUMBER

1. quantity

= collection of individual items that can be counted **is used with plural nouns**

In Czech: počet, množství

twenty-five students, several hundred applicants, one thousand crowns

Note:

*This year **a number of** students **were** not admitted to the course. (= i.e. a relatively large number)*

In Czech: řada

But: **The number of** students admitted to the course this year **is** lower.

In Czech: počet

2. symbol or word

In Czech: číslo, číslovka, číslice (písemná značka)

1, 2, 10, 150 - one, two, ten, one/a hundred and fifty

Notes :

- 13 (*thirteen*) is pronounced as [tɜ:ˈti:n] x 30 (*thirty*) is pronounced as [ˈtɜ:ty].

- **100, 1,000 and 1,000,000** are read as: **one/a** hundred/thousand/million if they are at the beginning of a number; **one/a** is also used with fractions.

Compare:

one/a hundred thousand people but: six thousand one hundred
one/a third of the population

- The words **hundred, thousand, million, billion** (= a thousand million), **several** and (a) **few** do not change if they are used after a number.

Compare:

two hundred meters **hundreds of meters**
twenty million Czech crowns **millions of Euros**
several hundred items of data

-The word **billion** means

a/one thousand million (in Czech: miliarda)

a/one million million (in older British usage), but now *a/one trillion*

Milliard = *a/one thousand million* is no longer used (technically)

- In writing, **tens and units** are usually connected by a **hyphen**.

33 - thirty-three, 98 ninety-eight

- In writing, **groups of three figures/digits** are in larger numbers separated by a **comma** or a **space**; in dates, the figures are not separated.

8,721 or 8 721, 2,865,213 or 2 865 213 in (the year) 2012

- In speaking, “**and**” is used if the words hundred, thousand, and million are followed by a **number below a hundred**; in American English “and” is usually omitted.

*525 – five hundred **and** twenty-five 7,001/7 000 – seven thousand **and** one*

In **expressions of measurements the noun after the numeral stays in the singular** and the two words are connected by a hyphen.

Compare:

*a **four-term** course a **course four terms long**
five **fifty-minute** lessons five **lessons each fifty minutes long***

- **Decimal numbers** use a **decimal point**, not a comma; each figure is read separately.

a 3.5 increase in prices , 3.1415 (read as three point one four one five)

- The word **per cent/percent** or the symbol % is used **with numbers**; otherwise the word “percentage” is used.

*Only 1 **per cent** of data was missing, which is a very low **percentage**.*

*a decrease of **17.5 %***

*this year’s high intake **percentage***

- The word “**number**” is often used

after the following adjectives:

cardinal/ordinal number (základní/řadová číslovka)

prime number (prvočíslo)

binary, complex, consecutive, decimal, even (sudé), equal, exact, finite (konečné),

imaginary, indefinite, infinite, irrational, natural, negative, odd (liché), positive,

random, rational, real, 6-digit, three-digit (trojciferné)

with the following verbs:

calculate, add, divide, multiply, subtract

3. position in a series

In Czech: číslo

in Equation 5, in Fig. 3., on page 6, at 18 High Street

Wrong: *in the Equation 5, in the Fig. 3., on the page 6*

4. copy of a journal, e.g. back number (starší číslo časopisu)

In Czech: číslo, výtisk

FIGURE

1. number or amount

An official number that has been counted or calculated, often used in the plural.

In Czech: cifra, číselný údaj, částka, suma

*Official **figures** have shown an increase in inflation.*

2. mathematical shape

In Czech: geometrický útvar, obrazec, těleso

*The circle is a plane **figure** (rovinný obrazec), but the sphere is a solid **figure** (těleso).*

3. illustration in a book

= diagram, picture (= photograph), chart, schematic (drawing), schema

In Czech: obrázek (tj. diagram, schéma, tabulka, obrázek v textu)

*The results are shown **in Fig.1**.*

DIGIT

= one of the written numbers from 0 to 9

In Czech: číslice od 0 do 9, místo v číselné soustavě, cifra

*an **8-digit** number*

*a **three-digit** (or three-figure) number*

NUMERAL

= symbol that represents a number

In Czech: číslice, cifra, číslovka

5, 3, 8

*The **Arabic and Roman numerals/numbers***

VII, IX, C (one hundred), D (five hundred), M (one thousand)

- The Czech word "**NULA**" is expressed as :

- **nought** (number 0 in BE) is used in counting (e.g. 0, 1, 2, 3, 4; 0.512)

- **zero** (number 0 in AE) is used in giving temperature (in both BE and AE)

it's 5 degrees below zero

- **0** (pronounced like the letter "o") is used in saying numbers individually,

e.g. telephone or account numbers, decimal numbers

my phone number is 737450021

- **nil** is used in giving scores in games

Celtic Glasgow two, Manchester United nil

- **love** is used in tennis games

forty love, Kvitová to serve

- **null** is used mainly in programming, meaning "nothing" or "empty value"

null element

II. Mathematical symbols and expressions

In English like in Czech, there is not one generally accepted "correct" way of reading mathematical symbols and expressions. The following pages give the most frequent usage. However, mathematicians usually prefer the shortest version if the context is clear.

Examples:

ab (= $a \cdot b$ / $a * b$)

read as: **ab or a times b**

a_b

read as: **ab or a sub b**

If it is necessary to distinguish the meaning of expressions; intonation may help.

Examples:

$a^n - 1$ read as: a to the power of n – pause – minus one/ a to the n th – pause – minus one a to the n – pause – minus onebut: a^{n-1} read as: a - pause – to the power of n minus one a – pause – to the n minus one

a) General symbols

Symbol	Czech	English
x'	x s čárkou	x prime/dash/dashed
x''	x s dvěma čárkami	x double prime
x^*	x s hvězdičkou	x star/starred
\bar{x}	x s pruhem	x bar
\tilde{x}	x s vlnovkou	x tilde
\hat{x}	x se stříškou	x hat
\vec{x}	x s šipkou	x arrow
x_1	x s indexem 1	x (sub)script one, x one
$x_{1,2}$	x s indexem 1,2	x sub one two
()	kulaté závorky	round brackets/parentheses
[]	hrnaté závorky	square brackets (BE), brackets (AE)
()	lomené závorky	angular brackets
{ }	složené závorky	braces/curly brackets
(...	závorka/otevřít závorku	open parentheses/ parentheses open
...)	závorka se zavře/zavřít závorku	close parentheses/ parentheses close
$(x + y)^2$	x plus y to celé na druhou	x plus y all squared
x_a	x s indexem $a/x a$	x sub/subscript $a/x a$
x_a	index dole (x_a)	subscript (x_a)
x^a	index nahoře (x^a)	superscript (x^a), exponent
x_{ij}	x s indexem ij	x ij/x with indices $i j$
$ a $	absolutní hodnota z a	absolute value of a (if a is a real number)
v.v.	a naopak	vice versa
\hbar	Planckova konstanta	h cross (Planck constant)
$\ x\ $	norma x	norm of x
$\bar{x}; \text{conj } x$	číslo komplexně sdružené s x	conjugate of x/x conjugated
$\arg x$	argument x	argument of x
$\text{Re}(a); \text{R}(a)$	reálná část čísla x	real part of x
$\text{Im}(a); \text{I}(a)$	imaginární část čísla x	imaginary part of x
a	malé písmeno a	small /lower case a
A	velké písmeno A /tiskací A ; tiskacím (písmem)	capital/upper case/large/big A ; A in block letters
a	silně vytištěno/vytištěné a	a in bold type/in bold
max	maximum	maximum
min	minimum	minimum
sup	supremum	supremum

inf	infimum	infimum
∞	nekonečno	infinity
/	lomeno/zlomková čára lomítko	over slash
0.25	nula celá 25	nought point two five
$5^{\circ}C, 10^{\circ}F, 273.1 K$	$5^{\circ} C, 10^{\circ} F, 273.1 K$	5 degrees Celsius, 10 degrees Fahrenheit, 273.1 Kelvin
π	pí , Ludolfovo číslo	pi [pai]
x_1, \dots, x_n	(od) x_1 do x_n	x_1 up to x_n
Σ	součet/suma (čeho), sigma	the sum (of), sigma
Π	součin/produkt (čeho)	the product of
$\bar{\lambda}$	lambda s pruhem	lambda bar
\therefore	tudíž; z toho plyne, že	therefore; it follows that
$x : y$	x se má ku y	x is to y
$\mathcal{P} : \mathcal{T}$	pro \mathcal{P} platí, že \mathcal{T}	for \mathcal{P} it holds that \mathcal{T}

Common mistakes:

Wrong: 5 degrees of Celsius, 10 degrees of Fahrenheit, 273.1 degrees (of) Kelvin

Right: 5 degrees Celsius, 10 degrees Fahrenheit, 273.1 Kelvin

b) Equality, quantity, percentage, proportionality, similarity

=	rovná se/je rovno	equals/is equal to
\neq	nerovná se/není rovno/(je) různé od	does not equal/is not equal to/(is) different from
\equiv	(je) totožno/(je) identicky rovno/je kongruentní	(is) identical to/with, (is) identically equal to/with
$\not\equiv$	není totožno/není identicky rovno	(is) not identical to/with, (is) not identically equal to/with
\exists	existuje	there exists
\nexists	neexistuje	there does not exist
\forall	pro všechna	for all/for every
\Rightarrow	(logicky) implikuje, jestliže, pak (logically) implies, if, then
\Leftrightarrow	je (logicky) rovno/ ekvivalentní, tehdy a jen	is (logically) equivalent to, iff/ if and only if
\neg	logický zápor	not, logical negation
\sim	(je) úměrné; (je) podobné	(is) proportional (to); (is) similar to
\approx, \doteq	(je) přibližně rovno/rovná se přibližně	approximately equals/(is) approximately equal to
\approx	(je) po zaokrouhlení rovno	rounded off gives
$<$	(je) menší než	(is) less than
$>$	(je) větší než	(is) greater than
\leq	(je) menší nebo rovno	(is) less than or equal to
\geq	(je) větší nebo rovno	(is) greater than or equal to

\nless	není menší než	(is) not less than
\ll	(je) mnohem (řádově) menší než	(is) much (by order of x) less than
\gg	(je) mnohem (řádově) větší než	(is) much (by order of x) greater than
$(3)\%$	procento (po číselné hodnotě)	per cent/percent (preceded by a figure)
$x : y = c : d$	x má se ku y jako c ku d (úměra)	x is to y as c is to d (proportion)

III. Basic operations

a) Addition: to add

$$x + y = c$$

x first summand/addend
 $+$ sign of addition
 y second summand/addend
 $=$ sign of equation
 c result
 read as : x **plus** y is equal to c /equals c

b) Subtraction: to subtract

$$x - y = c$$

x minuend
 $-$ sign of subtraction
 y subtrahend
 $=$
 c difference
 read as : x **minus** y is equal to c /equals c

c) Multiplication: to multiply (by)

$$x \cdot y = c \quad / \quad x \cdot y = c \quad / \quad x y = c$$

x factor/multiplicand
 \cdot multiplication sign
 y factor/multiplier
 $=$
 c product
 read as: x **times/multiplied** by y equals c
 $x y$ equals c (if the expression is not confusing)

once = $1 x$

twice/two times = $2 x$

three times = $3 x$

n times = $n x$

Examples:

$(a + b) x (a - b)$ read as: a plus b – pause – (the whole) times a minus b

d) Division: to divide (by)

$$x : y = c \quad / \quad x / y = c$$

x dividend
 $:$ sign of division
 y divisor
 $=$
 c quotient
 read as: x **divided by/x over** y equals c

e) Raising to the power: to raise to the power (of)

$$x^2 \quad \text{read as: } x \text{ squared/x to the power of two} \quad y^3 \quad \text{read as: } y \text{ cubed/y to the power of three}$$

x^2 base

power/exponent/index (pl. indices/indexes)

General formulas for reading:

x + to + the + n th (= ordinal number), x to the power of n

Examples:

a^n - a to the n th

a^5 - a to the fifth

a^{n+1} - a to the (power of) n plus one

a^{n-1} - a to the (power of) n minus one

$a^{1/3}$ - a to the one third

$a^{-1/3}$ - a to the minus one third

a^{-1} - a to the minus one

$a^{-1/x}$ - a to the minus one over x

f) Extraction of the root/evolution: to extract the root (of)

$\sqrt[n]{x} = a$ read as: **the cube root of x ** $\sqrt{y} = a$ read as: **the square root of y **

index (plural: indices [indis:z])

radical sign

root

General formula for reading :

the + n th (=ordinal number) root of

Examples:

$\sqrt[x]{a}$ - the x (th) root of a

$\sqrt[5]{\text{root of } x}$ - the fifth root of x

IV. Fractions

vulgar/proper/improper/decimal/reduced fraction = obecný/pravý/nepravý/desetinový/zkrácený zlomek

$1/3$ read as: one **third**

x/y read as: x **over** y

numerator

fraction line

denominator

General formulas for reading :

cardinal number + ordinal number/cardinal number + half/halves/quarter/quarters

Examples:

$1/10$ one tenth

$1/100$ one hundredth

$2/100$ two hundredths

$1/1,000$ one thousandth

$3\ 3/5$ three and three fifths

$1/4$ one fourth/AE quarter

$3/4$ three quarters

$1/2$ one half

$3/2$ three halve

numerator + over + denominator

Examples – read as:

a/b a over b $4\ 3/4$ four – pause – and three quarters

$1/x$ one over x $x^2 + 2/x$ x squared plus two - pause – (the whole) divided by/over x

V. Calculus and analysis

Calculus

In Czech, the term “kalkulus/kalkul” is quite rarely used. It is a branch of advanced mathematics, sometimes divided into differential and integral calculus. It deals with variable quantities and trains calculation competence.

(Mathematical) analysis

In Czech, the term “(matematická) analýza” provides theoretical foundations for advanced calculations based on mastery of the Calculus techniques.

Notation may often differ not only from country to country but also from university to university.

a) Functions

$f(x); F(x)$	funkce x	function (of) x / f of x / $f x$
$y = f(x)$	y se rovná funkci/je funkcí x	y is equal to the function (of) x / f of x / $f x$
$[a, b]; \langle a, b \rangle$	uzavřený interval	closed interval
$(a, b); [a, b]$	zleva otevřený a zprava uzavřený interval	half-open interval/interval open on the left and closed on the right
(a, b)	otevřený interval	open interval

b) Differentiation: to differentiate

to differentiate = a) derivovat

to derive = odvodit

b) rozlišit (to distinguish)

differentiation = derivace (matematická operace)

(first) derivative = (první) derivace (výsledek matematické operace)

dy	diferenciál y	differential y
∂y	variace y	a variation in y
Δy	přírůstek y	an increment of y
$\frac{dy}{dx}; \frac{df(x)}{dx}; y'; f'(x)$	první derivace y dle x , kde $y = f(x)$	the (first) derivative of y with respect to x , where $y = f(x)$; dy by dx
$f'(x_0)$	první derivace $f(x)$ v bodě x_0	the (first) derivative of f at x_0
$\frac{d^n y}{dx^n}; y^{(n)}; f^{(n)}(x)$	n -tá derivace y podle x	n th derivative of y with respect to x (w.r.t., WRT)
$\frac{d^2 y}{dx^2}$	druhá derivace y podle	d squared y with respect to dx squared
$\frac{\partial u}{\partial x}$	parciální derivace u dle x	partial derivative of u with respect to x ; partial dy by dx
$f_x(x_0, y_0)$	první parciální derivace $f(x, y)$ podle x v bodě x_0, y_0	the first partial derivative of $f(x, y)$ with respect to x at x_0, y_0
$\frac{\partial^2 u}{\partial x \partial y}$	druhá parciální derivace $u = f(x, y)$ podle x a y	the second partial derivative of $u = f(x, y)$ taken first with respect to x and then with respect to y

c) Integration: to integrate

integration by parts = integrace per partes

integration by substitution = integrace substitucí

integrand = integrand

integer = celé číslo

\int_a^b	vlastní integrál	proper integral
\int_a^{∞}	nevlastní integrál	improper integral
\int	(neurčitý) integrál	(indefinite) integral
\int_a^b	(určitý) integrál od a do b	the (definite) integral of from a to b
$\int k$	(křivkový) integrál podle křivky k	the (curve/line) integral of along the curve k
$\int s$	(plošný) integrál na ploše s	the (surface) integral of over the surface s
\iint	dvojný integrál	double integral
\iiint	trojný integrál	triple integral
$\int f(x) dx$	integrál $f(x)$ dle dx	the integral of $f(x)$ with respect to x /the primitive of $f(x)$
$\int_a^b f(x) dx$	integrál $f(x) dx$ od a do b	the integral of function $x dx$ from a to b /the definite integral of $f(x)$ between the limits a and b

d) Sums and products

\sum	součet/suma (výrazů, členů)	sum of (terms)
$\sum_1^n A_i ; \sum_{i=1}^n A_i$	součet (výrazů) A_i od $i = 1$ do n /suma A_i od 1 do n	the sum of A_i from i is equal to 1 to n
\prod	součin (výrazů)	the product of (terms)
$\prod_1^n A_i ; \prod_{i=1}^n A_i$	součin (výrazů) A_i od 1 do n	the product of A_i from i is equal to/equals 1 to n

e) Limits

\lim_{\rightarrow}	limita se blíží/blížící se	limit (of) tends to/ approaches/converges to
$\lim_{x \rightarrow a} f(x) = b$	limita $f(x)$ pro x blížíící se k a je rovno b	the limit of $f(x)$ where x approaches a is equal to b

$\lim_{x \rightarrow a} (f(x) + g(x)) = s + t$	limita $f(x)$ plus $g(x)$ pro x blíží se k a se rovná $s + t$	the limit of $f(x)$ plus $g(x)$ as x tends to a is equal to $s + t$
$\limsup; \overline{\lim}$	horní limita	limit superior
$\liminf; \underline{\lim}$	dolní limita	limit inferior

VI. Vectors, scalars

$a, A, \vec{a} \dots$	vektor a	vector a
$ a ; \alpha; \overline{AB} $	velikost (modul, absolutní hodnota) vektoru a	magnitude (modulus, the absolute value) of vector a
$\ a\ $	norma vektoru	norm of the vector
$a \cdot b$ { $a \cdot b$ }	a skalárně b /skalární součin vektorů a a b	a dot b ; scalar/dot product of vectors a and b
$a \times b$	a vektorově násobeno b /vektorový součin vektorů a a b	a cross b ; vector/cross product of vectors a and b
$\text{div } a; \nabla a$	divergence (vektorové funkce) a	divergence of a
$\text{grad } \varphi$	gradient skalární funkce φ	gradient of scalar function φ
$\text{rot } a; \text{curl } a$	rotace vektorové funkce a	curl of a
∇	nabla/del/Hamiltonův operátor	grad/gradient/Hamiltonian operator
Δ	delta/Laplaceův operátor	delta/Laplacian operator

VII.Sets

\emptyset	prázdná množina	null/empty set
$M = \emptyset$	M je prázdná množina	M is an empty set
$M = \{1,3\}$	M je množina sestávající z prvků 1 a 3	M is a set with elements 1 and 3
\in	je prvkem množiny/patří do množiny	is an element/a member of the set/belongs to (the set)
$x \in M$	x je prvkem množiny M	the point x is an element of/is a member of (the set) M
\notin	není prvkem (množiny)/nepatří do (množiny)	is not an element/a member of (the set)/does not belong to (the set)
$x \notin M$	x není prvkem množiny M	is not an element/a member of (the set) M /does not belong to (the set) M
\subset	je podmnožinou; značka inkluze	is a subset of
$M \subset N$	M je podmnožinou N	M is a subset of N /each point of M belongs to N
\supset	je nadmnožinou contains as a subset
$M \supset N$	M je nadmnožinou N	M is a superset of N /each

		point of N belongs to M
\cap	je průnikem	is the intersection of
$M = A \cap B$	(množina) M je průnikem (množiny) A a B	M is an intersection of A and B
\cup	je sjednocením	is the union/join/sum of
$M = A \cup B$	M je sjednocením (množiny) A a B	M is the union/join/sum of sums A and B
\therefore	tudíž	therefore/hence
\because	jelikož	since/because
\Rightarrow	implikuje	implies
\mathbb{N}, \mathbf{N}	množina přirozených čísel	set of natural numbers
\mathbb{Z}, \mathbf{Z}	množina celých čísel	set of integers
\mathbb{Q}, \mathbf{Q}	množina racionálních čísel	set of rational numbers
\mathbb{R}, \mathbf{R}	množina reálných čísel	set of real numbers

VIII. Matrices [meitrisi:z], sg. matrix [meitriks]

$\begin{vmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \dots & a_{mn} \end{vmatrix}$	determinant matice	matrix determinant
$\begin{pmatrix} a_{11} & \dots & a_{1n} \\ \vdots & \ddots & \vdots \\ a_{m1} & \dots & a_{mn} \end{pmatrix}$	obdélníková matice typu m, n (s m řádky a n sloupci)	rectangular matrix m by n (with m rows and n columns)
$\det A, A $	determinant čtvercové matice A	determinant of a square matrix A

IX. Logarithms

e	základ přirozeného logaritmu (2,71828	base of the natural logarithm (2.71282.....)
$\log x; \log_{10} x$	obecný/dekadický (Briggsův) logaritmus čísla x	common (Briggsian) logarithm of x ($\log x$ is used for \log_{10} if the context shows that the base is 10)
$\log_e x; \ln x^a$	přirozený logaritmus x	natural /Napierian logarithm of x
$\log_a x$	logaritmus čísla x při základu a	logarithm (base a) of x
$e^x; \exp x$	exponenciální funkce (při základu e) proměnné x	exponential function of x (of base e)

X. Combinatorics

$n!$	n faktoriál	factorial n/n factorial
$P(n,r)/{}_n P_r$	počet variací r -té třídy z n -prvků	number of permutations of n things taken r at a time
${}_n C_r / {}_n C / C(n,r) / \binom{n}{r}$	počet kombinací r -té třídy k n -prvkům $n!/[r!(n-r)!]$	number of combinations of n things taken r at a time

XI. Trigonometry

$\sin x$; sine x	sinus x	sine x
$\cos x$; cosine x	kosinus x	cosine/cos x
$\tan x$; tangent x	tangens x	tangent/tan x
$\cot x$; ctn x	kotangens x	cotangent/cotan/cot/ctn x
$\arcsin x$	arkussinus x	arcsine x /inverse sine of x / arc whose sine is x
$\arccos x$	arkuskosinus x	arccos x / inverse cosine of x /arc whose cosine is x

Note the difference: in English both $\cot x$ and $\text{ctn } x = \text{cotangent } x$

XII. Geometry

$A \cdot B$	bod $A/B/C$	point $A/B/C$
$a \cdot \text{---} \cdot b$	přímka a, b	straight line a, b
/	šikmá čára	oblique line
\sim	křivka	curve
$\angle \alpha$	úhel α	angle α
\sphericalangle	ostrý úhel	acute angle
\sphericalangle	tupý úhel	obtuse angle
L	pravý úhel	right angle
$ AB $	velikost/délka úsečky A až B	length of the line segment AB/distance AB
\perp	kolmý (na)	perpendicular (to)
\parallel	rovnoběžný (s)	parallel (with/to)
\triangle	trojúhelník	triangle
\square	čtverec	square
—	obdélník	rectangle
—	elipsa	ellipse
\bigcirc	kružnice/kruh	circle

XIII. Glossary of useful expressions and phrases

Basic nouns

equation, expression, formula, function, hypothesis, lemma, relation, statement, theorem, theory, corollary

quantity, value, constant, variable, proof, property

Frequent verbs followed by an object

(let us)

apply, check, choose, compute, consider, consist of, define, denote, depict, derive, determine, develop, employ, express, find, follow, note, obtain, outline, perform, possess, prove, reduce (krátit), represent, review, round off (zaokrouhlit), show, solve, transform, use, write + **something**

Frequent verbs followed by "that"

(let us)

assume, claim, conclude, consider, deduce, note, point out, prove, show, state, suppose, write + **that**

Phrases used to express

a) validity

the statement/equation/formula/condition holds/is true/is valid (..... if);
this theorem/formula/equation states/shows/indicates/asserts that

b) operations

to solve an equation; to carry over the result; to check the solution/result obtained; the expression that is to be derived; to reduce whole numbers to; to find the of; to write the equation in the form (of).....; to perform an operation; let us express in terms of; let us convert to; substitute for; the equation is not satisfied if; the equation is said to be satisfied iff (i.e. if and only if); it will be noted from the following expression that; obeys the law of

c) definitions

we define as; the function is defined as/is given by/can be defined as; we define to be; is by definition; define as/let be defined as equal to, where; in this way we obtain; the definition is in good agreement with

d) notation

let us denote by; let denote the; we will denote by the; denotes/stands for/expresses the; is denoted briefly by; the above expression may be denoted/written/expressed as; let a denote b ; the sign indicates that; we follow the notation used by/in; let a equal b /be equal to b

e) implications

then, accordingly, hence, thus, therefore, furthermore; consequently; we can conclude from that /hence/therefore; since gives/implies/yields; from what has been said it follows that; from the foregoing it is apparent that

f) assumptions

assume/suppose that; let us assume that; it is assumed that; unless otherwise stated we can assume that; as satisfies the above assumptions/requirements/conditions, we will need to make the following assumption; unless otherwise stated, we can assume to be an integer; under such assumption can be neglected; on the assumption that holds; the assumption/conclusion/hypothesis/theorem can be regarded as; assume/assuming the equation is valid for; let be a positive number; let a be equal to; let a equal

g) proofs

it has been proved/proven that; the proof for is evident; let us prove/observe/claim that; the proof consists of; to prove a statement

h) functions

injective (prostá), 1-to-1 (prostá), increasing, decreasing, monotonous, linear, smooth (hladká), continuous (spojitá), discontinuous, iterated, bounded (omezená), invertible, integrable, variable (proměnná); range (obor hodnot), domain (definiční obor)

i) sequences

increasing, decreasing, monotonous, convergent, bounded;
 n -th term (n -tý člen), partial sum, arithmetic progression (posloupnost), geometric progression

j) series

convergent, absolutely convergent, divergent, power series (mocninová řada), Fourier series

k) polynomials

quadratic, cubic, constant;

degree, leading term (vedoucí člen), constant term (absolutní koeficient), coefficient

l) sets

finite, infinite, countable, uncountable, connected (souvislá), ordered (uspořádaná), convex; family of sets (systém množin), cardinality (velikost), complement (doplňěk)

m) equations

linear, quadratic, cubic, quartic, algebraic, differential (diferenciální), difference (diferenční), integral (integrální);

system of equations, solution/root (řešení)

n) numbers

upper integer part, lower integer part; prime number, coprime numbers (čísla nesoudělná), composite number (složené číslo); quotient, remainder, divisibility (dělitelnost), lowest common multiple, greatest common divisor

Adjectives frequently used with the word "number":

abstract, binary, actual, adequate, approximate, average, big, complex, concrete, consecutive, considerable, decimal, equal, even (sudé), exact, finite [fainait], fixed, great, high, huge, imaginary, indefinite, infinite [infinít], irrational, large, low, mean, mixed, negative, odd (liché), overall, positive, precise, prime number (prvočíslo), random, rational, real, significant, 6-digit, three-digit (trojčiferné), small, substantial, total number (celkový počet);

growing, increasing, rising, declining, decreasing

o) geometry

straight line, line segment (úsečka), diameter [dai'æmitə], orthogonal, perpendicular, parallel, vertical, horizontal, parallelogram [,pærə'leləgræm] (rovnoběžník), circle (kružnice, kruh), disk (kruh), ball (koule), sphere (koule – kulový povrch), cylinder (válec), cone (kužel), cube (krychle), prism (hranol), plane (rovina, rovinný), space (prostor), body (těleso), surface (povrch), volume (objem)

XIV. Greek alphabet

Greek letters		English	Pronunciation
upper case	lower case		
A	α	alpha	['ælfə]
B	β	beta	['bi:tə]
Γ	γ	gamma	['gæmə]
Δ	δ	delta	['deltə]
E	ε	epsilon	['epsilən, ep'sailən]
Z	ζ	zeta	['zi:tə]
H	η	eta	['i:tə]
Θ	θ	theta	['θi:tə, θeitə]
I	ι	iota	[ai'outə]
K	κ	kappa	['kæpə]
Λ	λ	lambda	['læmdə]
M	μ	mu	['mju:]

Ν	ν	nu	['nju:]
Ξ	ξ	xi	['ksai, 'zai]['ksi:]
Ο	ο	omicron	['omikrən, ou'maikrən]
Π	π	pi	['pai]
Ρ	ρ	rho	['rou]
Σ	σ	sigma	['sigmə]
Τ	τ	tau	['to:] ['tau]
Υ	υ	upsilon	['apsilon, 'ipsilon]
Φ	φ	phi	['fai:] ['fi:]
Χ	χ	chi	['kai:] ['ki:]
Ψ	ψ	psi	['psai] ['psi:]
Ω	ω	omega	['oumigə] [ou'meigə]