

Numbers

How to write numbers

- Numbers can be written as symbols (10) or words (ten).
- In formal writing use symbols for large amounts and words for everything else.
- A decimal point is written as a “dot”, not a comma.
 - ▶ **example** 6.5 six point five
- A comma can be used to separate hundreds from thousands, from millions, ...
 - ▶ **example** 3,498,570

How to read numbers

- Numbers after the decimal dot, are read separately.
- The “zero” before a dot can be read as “nought” or not be read at all.
 - ▶ **example** 0.25 (nought/zero) point two five (**not** twentyfive)
- When reading a big number, do not use plural for “million”, “thousand” and “hundred”
 - ▶ **example** 6,200 six thousand two hundred (**not** thousands, **not** hundreds)
- One difference between British English (BrE) and American English (AmE) is the use of “and” when reading big numbers.
 - ▶ **example** 5,370 five thousand three hundred and seventy (in BrE, in AmE there is no “and”)

Scientific notation

- Numbers in scientific notation are written as:
 $a \times 10^b$ (“a times ten to the power of b”)
The exponent b is an integer, and the coefficient a is a real number between 1 and 10 called the *significant* or *mantissa*.

Expressions

- In mathematics, an **expression** is a finite combination of symbols and numbers.
 - Mathematical expressions are *calculated*, *solved* or *evaluated*.

Grouping

- If there is more than one level in a mathematical expression, brackets can be used in order to group the levels.
 - () left and right (round) brackets (*parentheses*, in AmE)
 - [] square brackets (only *brackets*, in AmE)
 - { } curly brackets (curly *braces*, in AmE)
 - ▶ **example** $\{[(3 - 4) \times 7 - 0.5] : 2\}$ open curly, square and round brackets, three minus four, close round brackets, times seven minus point five, close square brackets, all divided by two, close curly brackets.
- Expressions within parentheses are called *nested* expressions.

Symbols

IN SYMBOLS	IN WORDS	Examples
+	plus, add	$a + b$ a plus b
-	minus, take away, subtract	$a - b$ a minus b
±	plus or minus	
× · (dot product)	times, multiplied by	$a \times b$ ab , a times b $a \cdot b$ ab , a times b
÷	divided by	$\frac{a}{b}$ a over b , a divided by b in fractions, a is called the <i>numerator</i> and b the <i>denominator</i>
⋯ ⋯ (vinculum or fraction bar)		how to read fractions $\frac{1}{2}, \frac{5}{2}, \frac{2}{3}, \frac{7}{10}, \frac{\pi}{4}, \dots$ one half, five halves, two thirds, seven tenths, pi over four, ...
=	is equal, equals, is	$a = b$ a equals b or a is equal to b $1 + 2 = 3$ one plus two is (equals) three
≈	is approximately equal to	
≠	is not equal to	$a \neq b$ a is different from b , a is not equal to b
< > << >> ≥ ≤	inequality signs	$a < b$ a is (strictly) less than b $a > b$ a is (strictly) greater than b $a \ll b$ a is much less than b $a \gg b$ a is much greater than b $a \geq b$ a is greater than or equal to b $a \leq b$ a is less than or equal to b
%	percent	5 % five percent

square root

left (round) bracket

curly bracket

point two five

square bracket

cubed (to the third)

three fourths

one half

squared

right (round) bracket

$$\sqrt{\left\{ (0.25 \cdot 12) - \left[1 - \left(\frac{1}{3} + \frac{1}{6} \right) \right] \right\}^3 - \left(\frac{3}{4} + \frac{1}{2} - 3.5 \right)^2} = \frac{13}{4}$$