# Algebra symbols

| Symbol | Symbol Name | Meaning / definition | Example |
|---|---|---|---|
| $x$ | x variable | unknown value to find | when $2x = 4$, then $x = 2$ |
| $\equiv$ | equivalence | identical to | |
| $\triangleq$ | equal by definition | equal by definition | |
| $:=$ | equal by definition | equal by definition | |
| $\sim$ | approximately equal | weak approximation | $11 \sim 10$ |
| $\approx$ | approximately equal | approximation | $sin(0.01) \approx 0.01$ |
| $\propto$ | proportional to | proportional to | $y \propto x$ when $y = kx$, $k$ constant |
| $\infty$ | lemniscate | Infinity symbol | |
| $\ll$ | much less than | much less than | $1 \ll 1000000$ |
| $\gg$ | much greater than | much greater than | $1000000 \gg 1$ |
| $( )$ | parentheses | calculate expression inside first | $2 * (3+5) = 16$ |
| $[ ]$ | brackets | calculate expression inside first | $[(1+2)*(1+5)] = 18$ |
| $\{ \}$ | braces | Set | |
| $\lfloor x \rfloor$ | floor brackets | rounds number to lower integer | $\lfloor 4.3 \rfloor = 4$ |
| $\lceil x \rceil$ | ceiling brackets | rounds number to upper integer | $\lceil 4.3 \rceil = 5$ |
| $x!$ | exclamation mark | Factorial | $4! = 1*2*3*4 = 24$ |

| Symbol | Symbol Name | Meaning / definition | Example |
|---|---|---|---|
| $\lvert x \rvert$ | single vertical bar | absolute value | $\lvert -5 \rvert = 5$ |
| $f(x)$ | function of x | maps values of x to f(x) | $f(x) = 3x+5$ |
| $(f \circ g)$ | function composition | $(f \circ g)(x) = f(g(x))$ | $f(x)=3x, g(x)=x-1 \Rightarrow (f \circ g)(x)=3(x-1)$ |
| $(a,b)$ | open interval | $(a,b) = \{x \mid a < x < b\}$ | $x \in (2,6)$ |
| $[a,b]$ | closed interval | $[a,b] = \{x \mid a \leq x \leq b\}$ | $x \in [2,6]$ |
| $\Delta$ | delta | change / difference | $\Delta t = t_1 - t_0$ |
| $\Delta$ | discriminant | $\Delta = b^2 - 4ac$ | |
| $\sum$ | sigma | summation - sum of all values in range of series | $\sum x_i = x_1+x_2+\ldots+x_n$ |
| $\sum\sum$ | sigma | double summation | $\sum_{j=1}^{2}\sum_{i=1}^{8} x_{i,j} = \sum_{i=1}^{8} x_{i,1} + \sum_{i=1}^{8} x_{i,2}$ |
| $\prod$ | capital pi | product - product of all values in range of series | $\prod x_i = x_1 \cdot x_2 \cdot \ldots \cdot x_n$ |
| $e$ | E constant/ Euler's number | $e = 2.718281828...$ | $e = \lim (1+1/x)^x$ , $x \to \infty$ |
| $\gamma$ | Euler-mascheroni Constant | $\gamma = 0.5772156649...$ | |
| $\varphi$ | golden ratio | golden ratio constant | |
| $\pi$ | pi constant | $\pi = 3.141592654...$ is the ratio between the circumference and diameter of a circle | $c = \pi \cdot d = 2 \cdot \pi \cdot r$ |