Basic Math Symbols with Examples

Symbol	Symbol Name	Symbol Meaning	Example
x	x Variable	unknown value to find	when $3x = 9$, then $x = 3$
$\equiv$	Congruence Relation	identical to	$5 \equiv 2 \pmod 3$
$\triangleq$	Is Equal By Definition	is equal by definition	a$\triangleq$b
$:\leftrightarrow$	Is Equal By Definition	is equal by definition	A$:\leftrightarrow$B
$:=$	Is Equal By Definition	is equal by definition	a$:=$b
~	Approximately Equal	is similar to	ΔABC ~ ΔDEF means triangle ABC is similar to triangle DEF.
$\approx$	Approximately Equal	approximation	$\varphi = \dfrac{1 + \sqrt{5}}{2} \approx 1.6180339887\ldots$
$\propto$	Is Proportional to	is proportional to	$y \propto x$ means, when $y = kx$, k constant
∞	Lemniscate	infinity symbol	$1 / 0 = \infty$
$\ll$	Much Less Than	x $\ll$ y means x is much less than y.	$0.001 \ll 1000000$
$\gg$	Much Greater Than	x $\gg$ y means x is much greater than y.	$1000000 \gg 0.001$
( )	Parentheses	calculate expression inside first	$3 * (3+3) = 18$
[ ]	Brackets	calculate expression inside first	$[(1+1)*(1+1)] = 4$
{ }	Braces	set	{..., -3,-2,-1,0,1,2,3, ... }
$\lfloor x \rfloor$	Floor Brackets	rounds number to lower integer	$\lfloor 5.4 \rfloor = 5$
$\lceil x \rceil$	Ceiling Brackets	rounds number to upper integer	$\lceil 5.4 \rceil = 6$
$x!$	Exclamation Mark	factorial	$3! = 1*2*3 = 6$
$\lvert x \rvert$	Single Vertical Bar	absolute value	$\lvert -8 \rvert = 8$
$f(x)$	Function of x	maps values of x to f(x)	$f(x) = 2x+3$

Symbol	Symbol Name	Symbol Meaning	Example
$(f \circ g)$	Function Composition	$(f \circ g)\,(x) = f(g(x))$	$f(x)=3x,\ g(x)=x\text{-}1 \Rightarrow (f \circ g)(x)=3(x\text{-}1)$
(a,b)	Open Interval	$(a,b) = \{x \mid a < x < b\}$	$x \in (3,9)$
$[a,b]$	Closed Interval	$[a,b] = \{x \mid a \le x \le b\}$	$x \in [3,9]$
Δ	Delta	change / difference	$\Delta t = t_1 - t_0$
Δ	Discriminant	$\Delta = b^2 - 4ac$	$\Delta = 5^2\text{-}4(1)(4),\ = 25 - 16\ ,\ = 9$
$\sum$	Sigma	summation - sum of all values in range of series	$\sum x_i = x_1+x_2+...+x_n$
$\sum\sum$	Sigma	double summation	$\displaystyle\sum_{i=1}^{k}\sum_{j=1}^{m} a_{ij} = \sum_{j=1}^{m}\sum_{i=1}^{k} a_{ij}$
$\prod$	Capital pi	product - product of all values in range of series	$\prod x_i = x_1 \cdot x_2 \cdot ... \cdot x_n$
e	e Constant/ Euler's Number	$e = 2.718281828...$	$e = \lim\,(1+1/x)^x,\ x \to \infty$
γ	Euler-Mascheroni constant	$\gamma = 0.527721566...$	$\displaystyle \gamma = \lim_{x \to \infty}\left[\sum_{p \le x}\ln\left(\frac{1}{1-\frac{1}{p}}\right) - \ln\ln x\right].$
φ	Golden Ratio	golden ratio constant	$\displaystyle \varphi = \frac{1+\sqrt{5}}{2} \approx 1.6180339887...$
π	pi Constant	$\pi = 3.141592654...$ is the ratio between the circumference and diameter of a circle	$\pi_{\text{Age,Weight}}(\text{Person})$