### Mathematical Symbols

List of all mathematical symbols and signs - meaning and examples.

#### Basic math symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Symbol Name</th>
<th>Meaning / definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>=</td>
<td>equals sign</td>
<td>equality</td>
<td>5 = 2+3</td>
</tr>
<tr>
<td>≠</td>
<td>not equal sign</td>
<td>inequality</td>
<td>5 ≠ 4</td>
</tr>
<tr>
<td>&gt;</td>
<td>strict inequality</td>
<td>greater than</td>
<td>5 &gt; 4</td>
</tr>
<tr>
<td>&lt;</td>
<td>strict inequality</td>
<td>less than</td>
<td>4 &lt; 5</td>
</tr>
<tr>
<td>≥</td>
<td>inequality</td>
<td>greater than or equal to</td>
<td>5 ≥ 4</td>
</tr>
<tr>
<td>≤</td>
<td>inequality</td>
<td>less than or equal to</td>
<td>4 ≤ 5</td>
</tr>
<tr>
<td>( )</td>
<td>parentheses</td>
<td>calculate expression inside first</td>
<td>2 × (3+5) = 16</td>
</tr>
<tr>
<td>[ ]</td>
<td>brackets</td>
<td>calculate expression inside first</td>
<td>[(1+2)*(1+5)] = 18</td>
</tr>
<tr>
<td>+</td>
<td>plus sign</td>
<td>addition</td>
<td>1 + 1 = 2</td>
</tr>
<tr>
<td>−</td>
<td>minus sign</td>
<td>subtraction</td>
<td>2 − 1 = 1</td>
</tr>
<tr>
<td>±</td>
<td>plus - minus</td>
<td>both plus and minus operations</td>
<td>3 ± 5 = 8 and -2</td>
</tr>
<tr>
<td>±±</td>
<td>minus - plus</td>
<td>both minus and plus operations</td>
<td>3 ± 5 = -2 and 8</td>
</tr>
<tr>
<td>∗</td>
<td>asterisk</td>
<td>multiplication</td>
<td>2 ∗ 3 = 6</td>
</tr>
<tr>
<td>×</td>
<td>times sign</td>
<td>multiplication</td>
<td>2 × 3 = 6</td>
</tr>
<tr>
<td>⋅</td>
<td>multiplication dot</td>
<td>multiplication</td>
<td>2 · 3 = 6</td>
</tr>
<tr>
<td>÷</td>
<td>division sign / obelus</td>
<td>division</td>
<td>6 ÷ 2 = 3</td>
</tr>
<tr>
<td>/</td>
<td>division slash</td>
<td>division / fraction</td>
<td>6 / 2 = 3</td>
</tr>
<tr>
<td>−</td>
<td>horizontal line</td>
<td>division / fraction</td>
<td>( \frac{6}{2} = 3 )</td>
</tr>
<tr>
<td>mod</td>
<td>modulo</td>
<td>remainder calculation</td>
<td>7 mod 2 = 1</td>
</tr>
<tr>
<td>.</td>
<td>period</td>
<td>decimal point, decimal separator</td>
<td>2.56 = 2+56/100</td>
</tr>
<tr>
<td>( a^b )</td>
<td>power</td>
<td>exponent</td>
<td>( 2^3 = 8 )</td>
</tr>
<tr>
<td>( a^{^b} )</td>
<td>caret</td>
<td>exponent</td>
<td>( 2^{^3} = 8 )</td>
</tr>
<tr>
<td>( \sqrt{a} )</td>
<td>square root</td>
<td>( \sqrt{a} \cdot \sqrt{a} = a )</td>
<td>( \sqrt{9} = ±3 )</td>
</tr>
<tr>
<td>( 3\sqrt{a} )</td>
<td>cube root</td>
<td>( 3\sqrt{a} = 2 )</td>
<td></td>
</tr>
<tr>
<td>( 4\sqrt{a} )</td>
<td>forth root</td>
<td>( 4\sqrt{16} = ±2 )</td>
<td></td>
</tr>
<tr>
<td>( n\sqrt{a} )</td>
<td>n-th root (radical)</td>
<td>( \text{for } n=3, n\sqrt[3]{8} = 2 )</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>percent</td>
<td>1% = 1/100</td>
<td>10% × 30 = 3</td>
</tr>
</tbody>
</table>
### Geometry symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Symbol Name</th>
<th>Meaning / definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>∠</td>
<td>angle</td>
<td>formed by two rays</td>
<td>∠ABC = 30º</td>
</tr>
<tr>
<td>∠</td>
<td>measured angle</td>
<td></td>
<td>∠ABC = 30º</td>
</tr>
<tr>
<td>∡</td>
<td>spherical angle</td>
<td></td>
<td>∡AOB = 30º</td>
</tr>
<tr>
<td>⊥</td>
<td>right angle</td>
<td>= 90º</td>
<td>α = 90º</td>
</tr>
<tr>
<td>°</td>
<td>degree</td>
<td>1 turn = 360º</td>
<td>α = 60º</td>
</tr>
<tr>
<td>′</td>
<td>arcminute</td>
<td>1º = 60′</td>
<td>α = 60°59′</td>
</tr>
<tr>
<td>″</td>
<td>arcsecond</td>
<td>1′ = 60″</td>
<td>α = 60°59′59″</td>
</tr>
<tr>
<td>AB</td>
<td>line</td>
<td>line from point A to point B</td>
<td></td>
</tr>
<tr>
<td>→ AB</td>
<td>ray</td>
<td>line that start from point A</td>
<td></td>
</tr>
<tr>
<td>┴</td>
<td>perpendicular</td>
<td>perpendicular lines (90º angle)</td>
<td>AC ┴ BC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>parallel</td>
</tr>
<tr>
<td>≅</td>
<td>congruent to</td>
<td>equivalence of geometric shapes and size</td>
<td>ΔABC ≅ ΔXYZ</td>
</tr>
<tr>
<td>~</td>
<td>similarity</td>
<td>same shapes, not same size</td>
<td>ΔABC ~ ΔXYZ</td>
</tr>
<tr>
<td>Δ</td>
<td>triangle</td>
<td>triangle shape</td>
<td>ΔABC ≅ ΔBCD</td>
</tr>
<tr>
<td></td>
<td>x−y</td>
<td></td>
<td>distance</td>
</tr>
<tr>
<td>π</td>
<td>pi constant</td>
<td>π = 3.141592654...</td>
<td>c = πd = 2πr</td>
</tr>
<tr>
<td>rad</td>
<td>radians</td>
<td>radians angle unit</td>
<td>360º = 2π rad</td>
</tr>
<tr>
<td>grad</td>
<td>grads</td>
<td>grads angle unit</td>
<td>360º = 400 grad</td>
</tr>
</tbody>
</table>

### Algebra symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Symbol Name</th>
<th>Meaning / definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>x variable</td>
<td>unknown value to find</td>
<td>when 2x = 4, then x = 2</td>
</tr>
<tr>
<td>≡</td>
<td>equivalence</td>
<td>identical to</td>
<td></td>
</tr>
<tr>
<td>Δ</td>
<td>equal by definition</td>
<td>equal by definition</td>
<td></td>
</tr>
<tr>
<td>¨</td>
<td>equal by definition</td>
<td>equal by definition</td>
<td></td>
</tr>
<tr>
<td>~</td>
<td>approximately equal</td>
<td>weak approximation</td>
<td>11 ~ 10</td>
</tr>
<tr>
<td>≈</td>
<td>approximately equal</td>
<td>approximation</td>
<td>sin(0.01) ≈ 0.01</td>
</tr>
<tr>
<td>∞</td>
<td>proportional to</td>
<td>proportional to</td>
<td>f(x) ∝ g(x)</td>
</tr>
<tr>
<td>∞</td>
<td>infinity symbol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≪</td>
<td>much less than</td>
<td>much less than</td>
<td>1 ≪ 1000000</td>
</tr>
<tr>
<td>≫</td>
<td>much greater than</td>
<td>much greater than</td>
<td>1000000 ≫ 1</td>
</tr>
<tr>
<td>()</td>
<td>parentheses</td>
<td>calculate expression inside first</td>
<td>2 * (3+5) = 16</td>
</tr>
<tr>
<td>[ ]</td>
<td>brackets</td>
<td>calculate expression inside first</td>
<td>[(1+2)*(1+5)] = 18</td>
</tr>
<tr>
<td>{ }</td>
<td>braces</td>
<td>set</td>
<td></td>
</tr>
<tr>
<td>⌊x⌋</td>
<td>floor brackets</td>
<td>rounds number to lower integer</td>
<td>⌊4.3⌋ = 4</td>
</tr>
</tbody>
</table>
### Mathematical Symbols

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<thead>
<tr>
<th>Symbol</th>
<th>Meaning / definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>ceiling brackets</td>
</tr>
<tr>
<td>( x! )</td>
<td>factorial</td>
</tr>
<tr>
<td>( \mid x \mid )</td>
<td>absolute value</td>
</tr>
<tr>
<td>( f(x) )</td>
<td>function of x</td>
</tr>
<tr>
<td>( (f \circ g) )</td>
<td>function composition</td>
</tr>
<tr>
<td>( (a,b) )</td>
<td>open interval</td>
</tr>
<tr>
<td>( [a,b] )</td>
<td>closed interval</td>
</tr>
<tr>
<td>( \Delta )</td>
<td>delta</td>
</tr>
<tr>
<td>( \sum )</td>
<td>summation</td>
</tr>
<tr>
<td>( \prod )</td>
<td>product</td>
</tr>
<tr>
<td>( e )</td>
<td>e constant / Euler's number</td>
</tr>
<tr>
<td>( \gamma )</td>
<td>Euler-Mascheroni constant</td>
</tr>
<tr>
<td>( \phi )</td>
<td>golden ratio</td>
</tr>
</tbody>
</table>

### Linear Algebra Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning / definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \cdot )</td>
<td>dot</td>
</tr>
<tr>
<td>( \times )</td>
<td>cross</td>
</tr>
<tr>
<td>( A \otimes B )</td>
<td>tensor product</td>
</tr>
<tr>
<td>( \langle x, y \rangle )</td>
<td>inner product</td>
</tr>
<tr>
<td>( [ ] )</td>
<td>brackets</td>
</tr>
<tr>
<td>( ( ) )</td>
<td>parentheses</td>
</tr>
<tr>
<td>( \mid A \mid )</td>
<td>determinant</td>
</tr>
<tr>
<td>( \det(A) )</td>
<td>determinant of matrix A</td>
</tr>
<tr>
<td>( | x | )</td>
<td>double vertical bars</td>
</tr>
<tr>
<td>( A^T )</td>
<td>transpose</td>
</tr>
<tr>
<td>( A^\dagger )</td>
<td>Hermitian matrix</td>
</tr>
<tr>
<td>( A^* )</td>
<td>Hermitian matrix</td>
</tr>
<tr>
<td>( A^{-1} )</td>
<td>inverse matrix</td>
</tr>
<tr>
<td>rank(A)</td>
<td>matrix rank</td>
</tr>
<tr>
<td>dim(U)</td>
<td>dimension</td>
</tr>
</tbody>
</table>

### Probability and statistics symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning / definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>( P(A) )</td>
<td>probability function</td>
</tr>
<tr>
<td>( P(A \cap B) )</td>
<td>probability of events intersection</td>
</tr>
<tr>
<td>( P(A \cup B) )</td>
<td>probability of events union</td>
</tr>
<tr>
<td>( P(A \mid B) )</td>
<td>conditional probability function</td>
</tr>
</tbody>
</table>

### Example

- \( \lceil 4.3 \rceil = 5 \)
- \( 4! = 1 \times 2 \times 3 \times 4 = 24 \)
- \( | -5 | = 5 \)
- \( (f \circ g)(x) = f(g(x)) \)
- \( (a,b) \triangleq \{ x \mid a < x < b \} \)
- \( [a,b] \triangleq \{ x \mid a \leq x \leq b \} \)
- \( \Delta t = t_1 - t_0 \)
- \( \Delta \triangleq b^2 - 4ac \)
- \( \sum_{i=1}^{8} x_{i,j} = \sum_{i=1}^{8} x_{i,1} + \sum_{i=1}^{8} x_{i,2} \)
- \( e = \lim_{x \to \infty} (1 + \frac{1}{x})^x = 2.718281828... \)
- \( \gamma = 0.527721566... \)
- \( \phi = 0.618033988... \)
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f(x)$</td>
<td>probability density function (pdf)</td>
<td>$P(a \leq x \leq b) = \int f(x) , dx$</td>
</tr>
<tr>
<td>$F(x)$</td>
<td>cumulative distribution function (cdf)</td>
<td>$F(x) = P(X \leq x)$</td>
</tr>
<tr>
<td>$\mu$</td>
<td>population mean</td>
<td>mean of population values</td>
</tr>
<tr>
<td>$E(X)$</td>
<td>expectation value</td>
<td>expected value of random variable $X$</td>
</tr>
<tr>
<td>$E(X</td>
<td>Y)$</td>
<td>conditional expectation</td>
</tr>
<tr>
<td>$\text{var}(X)$</td>
<td>variance</td>
<td>variance of random variable $X$</td>
</tr>
<tr>
<td>$\sigma^2$</td>
<td>variance</td>
<td>variance of population values</td>
</tr>
<tr>
<td>$\text{std}(X)$</td>
<td>standard deviation</td>
<td>standard deviation of random variable $X$</td>
</tr>
<tr>
<td>$\sigma_X$</td>
<td>standard deviation</td>
<td>standard deviation value of random variable $X$</td>
</tr>
<tr>
<td>$\hat{x}$</td>
<td>median</td>
<td>middle value of random variable $x$</td>
</tr>
<tr>
<td>$\text{cov}(X, Y)$</td>
<td>covariance</td>
<td>covariance of random variables $X$ and $Y$</td>
</tr>
<tr>
<td>$\text{corr}(X, Y)$</td>
<td>correlation</td>
<td>correlation of random variables $X$ and $Y$</td>
</tr>
<tr>
<td>$\rho_{X,Y}$</td>
<td>correlation</td>
<td>correlation of random variables $X$ and $Y$</td>
</tr>
<tr>
<td>$\sum$</td>
<td>summation</td>
<td>summation - sum of all values in range of series</td>
</tr>
<tr>
<td>$\Sigma\Sigma$</td>
<td>double summation</td>
<td>double summation</td>
</tr>
<tr>
<td>$M_0$</td>
<td>mode</td>
<td>value that occurs most frequently in population</td>
</tr>
<tr>
<td>$MR$</td>
<td>mid-range</td>
<td>$(x_{\text{max}} + x_{\text{min}})/2$</td>
</tr>
<tr>
<td>$Md$</td>
<td>sample median</td>
<td>half the population is below this value</td>
</tr>
<tr>
<td>$Q_1$</td>
<td>lower / first quartile</td>
<td>25% of population are below this value</td>
</tr>
<tr>
<td>$Q_2$</td>
<td>median / second quartile</td>
<td>50% of population are below this value = median of samples</td>
</tr>
<tr>
<td>$Q_3$</td>
<td>upper / third quartile</td>
<td>75% of population are below this value</td>
</tr>
<tr>
<td>$\bar{x}$</td>
<td>sample mean</td>
<td>average / arithmetic mean</td>
</tr>
<tr>
<td>$s^2$</td>
<td>sample variance</td>
<td>population samples variance estimator</td>
</tr>
<tr>
<td>$s$</td>
<td>sample standard deviation</td>
<td>population samples standard deviation estimator</td>
</tr>
<tr>
<td>$z_x$</td>
<td>standard score</td>
<td>$z_x = (x - \bar{x}) / s_x$</td>
</tr>
<tr>
<td>$X \sim$</td>
<td>distribution of $X$</td>
<td>distribution of random variable $X$</td>
</tr>
<tr>
<td>$N(\mu, \sigma^2)$</td>
<td>normal distribution</td>
<td>gaussian distribution</td>
</tr>
<tr>
<td>$U(a,b)$</td>
<td>uniform distribution</td>
<td>equal probability in range $a,b$</td>
</tr>
<tr>
<td>$\text{exp}(\lambda)$</td>
<td>exponential distribution</td>
<td>$f(x) = \lambda e^{-\lambda x}, x \geq 0$</td>
</tr>
<tr>
<td>$\text{gamma}(c, \lambda)$</td>
<td>gamma distribution</td>
<td>$f(x) = \lambda e^{x-1} e^{-\lambda x} / \Gamma(c), x \geq 0$</td>
</tr>
<tr>
<td>$\chi^2(k)$</td>
<td>chi-square distribution</td>
<td>$f(x) = x^{k/2-1} e^{-x/2} / (2^{k/2} \Gamma(k/2))$</td>
</tr>
<tr>
<td>$F(k_1, k_2)$</td>
<td>F distribution</td>
<td></td>
</tr>
<tr>
<td>$\text{Bin}(n,p)$</td>
<td>binomial distribution</td>
<td>$f(k) = \binom{n}{k} p^k (1-p)^{n-k}$</td>
</tr>
<tr>
<td>$\text{Poisson}(\lambda)$</td>
<td>Poisson distribution</td>
<td>$f(k) = \lambda^k e^{-\lambda} / k!$</td>
</tr>
<tr>
<td>$\text{Geom}(p)$</td>
<td>geometric distribution</td>
<td>$f(k) = \lambda^k e^{-\lambda} / k!$</td>
</tr>
<tr>
<td>$\text{HG}(N,K,n)$</td>
<td>hyper-geometric distribution</td>
<td></td>
</tr>
<tr>
<td>$\text{Bern}(p)$</td>
<td>Bernoulli distribution</td>
<td></td>
</tr>
</tbody>
</table>
### Combinatorics Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Symbol Name</th>
<th>Meaning / definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>$n!$</td>
<td>factorial</td>
<td>$n! = 1 \cdot 2 \cdot 3 \cdot \ldots \cdot n$</td>
<td>$5! = 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 = 120$</td>
</tr>
<tr>
<td>$nP_k$</td>
<td>permutation</td>
<td>$nP_k = \frac{n!}{(n-k)!}$</td>
<td>$sP_3 = 5! / (5-3)! = 60$</td>
</tr>
<tr>
<td>$nC_k$</td>
<td>combination</td>
<td>$nC_k = \binom{n}{k} = \frac{n!}{k!(n-k)!}$</td>
<td>$5C_3 = 5!/3!(5-3)! = 10$</td>
</tr>
</tbody>
</table>

### Set theory symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Symbol Name</th>
<th>Meaning / definition</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>{}</td>
<td>set</td>
<td>a collection of elements</td>
<td>$A={3,7,9,14}, B={9,14,28}$</td>
</tr>
<tr>
<td>$A \cap B$</td>
<td>intersection</td>
<td>objects that belong to set $A$ and set $B$</td>
<td>$A \cap B = {9,14}$</td>
</tr>
<tr>
<td>$A \cup B$</td>
<td>union</td>
<td>objects that belong to set $A$ or set $B$</td>
<td>$A \cup B = {3,7,9,14,28}$</td>
</tr>
<tr>
<td>$A \subseteq B$</td>
<td>subset</td>
<td>subset has less elements or equal to the set</td>
<td>${9,14,28} \subseteq {9,14,28}$</td>
</tr>
<tr>
<td>$A \subset B$</td>
<td>proper subset / strict subset</td>
<td>subset has less elements than the set</td>
<td>${9,14} \subset {9,14,28}$</td>
</tr>
<tr>
<td>$A \nsubseteq B$</td>
<td>not subset</td>
<td>left set not a subset of right set</td>
<td>${9,66} \nsubseteq {9,14,28}$</td>
</tr>
<tr>
<td>$A \supseteq B$</td>
<td>superset</td>
<td>set $A$ has more elements or equal to the set</td>
<td>${9,14,28} \supseteq {9,14,28}$</td>
</tr>
<tr>
<td>$A \supset B$</td>
<td>proper superset / strict superset</td>
<td>set $A$ has more elements than set $B$</td>
<td>${9,14,28} \supset {9,14}$</td>
</tr>
<tr>
<td>$A \nsubseteq B$</td>
<td>not superset</td>
<td>set $A$ is not a superset of set $B$</td>
<td>${9,14,28} \nsubseteq {9,66}$</td>
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<td>$2^A$</td>
<td>power set</td>
<td>all subsets of $A$</td>
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<tr>
<td>$\mathcal{P}(A)$</td>
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<td>all subsets of $A$</td>
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<td>$A = B$</td>
<td>equality</td>
<td>both sets have the same members</td>
<td>$A={3,9,14}, B={3,9,14}, A=B$</td>
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<tr>
<td>$A^c$</td>
<td>complement</td>
<td>all the objects that do not belong to set $A$</td>
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<td>$A \setminus B$</td>
<td>relative complement</td>
<td>objects that belong to $A$ and not to $B$</td>
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<tr>
<td>$A - B$</td>
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<td>$A \Delta B$</td>
<td>symmetric difference</td>
<td>objects that belong to $A$ or $B$ but not to their intersection</td>
<td>$A={3,9,14}, B={1,2,3}, A \Delta B={1,2,9,14}$</td>
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<tr>
<td>$A \oplus B$</td>
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<td>objects that belong to $A$ or $B$ but not to their intersection</td>
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<td>$(a,b)$</td>
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<td>collection of 2 elements</td>
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<td>$A \times B$</td>
<td>cartesian product</td>
<td>set of all ordered pairs from $A$ and $B$</td>
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<td>$</td>
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<td>cardinality</td>
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<td>$A={3,9,14}, #A=3$</td>
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<td>$\emptyset = {}$</td>
<td>$C = {\emptyset}$</td>
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<td>$U$</td>
<td>universal set</td>
<td>set of all possible values</td>
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<td>$\mathbb{N}_0$</td>
<td>natural numbers set (with zero)</td>
<td>$\mathbb{N}_0 = {0,1,2,3,4,\ldots}$</td>
<td>$0 \in \mathbb{N}_0$</td>
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<td>Natural numbers set (without zero) ( \mathbb{N}_1 )</td>
<td>( \mathbb{N}_1 = {1,2,3,4,5,...} )</td>
<td>6 ∈ ( \mathbb{N}_1 )</td>
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<td>Integer numbers set ( \mathbb{Z} )</td>
<td>( \mathbb{Z} = {-3,-2,-1,0,1,2,3,...} )</td>
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<td>Rational numbers set ( \mathbb{Q} )</td>
<td>( \mathbb{Q} = {x</td>
<td>x=a/b, a,b \in \mathbb{N}_1} )</td>
<td>2/6 ∈ ( \mathbb{Q} )</td>
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<td>Real numbers set ( \mathbb{R} )</td>
<td>( \mathbb{R} = {x</td>
<td>-\infty &lt; x &lt; \infty} )</td>
<td>6.343434 ∈ ( \mathbb{R} )</td>
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<tr>
<td>Complex numbers set ( \mathbb{C} )</td>
<td>( \mathbb{C} = {z</td>
<td>z=a+bi, -\infty &lt; a &lt; \infty, -\infty &lt; b &lt; \infty} )</td>
<td>6+2i ∈ ( \mathbb{C} )</td>
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### Logic symbols

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<th>Symbol</th>
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<th>Example</th>
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<td>( x \cdot y )</td>
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<td>^</td>
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<td>and</td>
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<td>bar</td>
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<td>∵</td>
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### Calculus & analysis symbols

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<th>Example</th>
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<td>( \lim_{x \to a} f(x) )</td>
<td>limit</td>
<td>limit value of a function</td>
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<td>ε</td>
<td>epsilon</td>
<td>represents a very small number, near zero</td>
<td>( \varepsilon \to 0 )</td>
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<td>e</td>
<td>e constant / Euler's number</td>
<td>( e = 2.718281828... )</td>
<td>( e = \lim (1+1/x)^x, x \to \infty )</td>
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<td>y'</td>
<td>derivative</td>
<td>derivative - Leibniz's notation</td>
<td>( (3x^3)' = 9x^2 )</td>
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<tr>
<td>y''</td>
<td>second derivative</td>
<td>derivative of derivative</td>
<td>( (3x^3)^{''} = 18x )</td>
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<tr>
<td>( y^{(n)} )</td>
<td>nth derivative</td>
<td>n times derivation</td>
<td>( (3x^3)^{(3)} = 18 )</td>
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<tr>
<td>( dy \over dx )</td>
<td>derivative</td>
<td>derivative - Lagrange's notation</td>
<td>( d(3x^3)/dx = 9x^2 )</td>
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<tr>
<td>( d^2y \over dx^2 )</td>
<td>second derivative</td>
<td>derivative of derivative</td>
<td>( d^2(3x^3)/dx^2 = 18x )</td>
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<tr>
<td>( d^n y \over dx^n )</td>
<td>nth derivative</td>
<td>n times derivation</td>
<td>( d^3y/dx^3 = 18 )</td>
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<td>( dy/\Delta x )</td>
<td>time derivative</td>
<td>derivative by time - Newton notation</td>
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<td>( \dddot{y} )</td>
<td>time second derivative</td>
<td>( \frac{\partial f(x, y)}{\partial x} )</td>
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<td>double integral</td>
<td>integration of function of 2 variables</td>
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<td>closed volume integral</td>
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<td>( \iiint )</td>
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<td>( [a, b] )</td>
<td>closed interval</td>
<td>( [a, b] = { x \mid a \leq x \leq b } )</td>
<td>( [a, b] )</td>
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<td>( (a, b) )</td>
<td>open interval</td>
<td>( (a, b) = { x \mid a &lt; x &lt; b } )</td>
<td>( (a, b) )</td>
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<td>( i )</td>
<td>imaginary unit</td>
<td>( i = \sqrt{-1} )</td>
<td>( i \equiv \sqrt{-1} )</td>
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<td>( z^* )</td>
<td>complex conjugate</td>
<td>( z = a+bi \rightarrow z^* = a-bi )</td>
<td>( z^* = 3 + 2i )</td>
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<td>( z )</td>
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<td>( \nabla )</td>
<td>nabla / ( \Delta )</td>
<td>gradient / divergence operator</td>
<td>( \nabla f(x, y, z) )</td>
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<td>( \vec{x} )</td>
<td>vector</td>
<td>( \vec{x} )</td>
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<td>( \hat{x} )</td>
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<td>( x * y )</td>
<td>convolution</td>
<td>( y(t) = x(t) * h(t) )</td>
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<td>Laplace transform</td>
<td>( F(s) = \mathcal{L}{f(t)} )</td>
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<td>( \mathcal{F} )</td>
<td>Fourier transform</td>
<td>( X(\omega) = \mathcal{F}{f(t)} )</td>
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<td>( \delta )</td>
<td>delta function</td>
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**Numeral symbols**

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