

| Trig Identities | |
|------------------|---|
| $\tan x$ | $= \frac{\sin x}{\cos x}$ |
| $\cot x$ | $= \frac{1}{\tan x}$ |
| $\sec x$ | $= \frac{1}{\cos x}$ |
| $\csc x$ | $= \frac{1}{\sin x}$ |
| 1 | $= \sin^2 x + \cos^2 x$ |
| $\cos x$ | $= \sin(\frac{\pi}{2} - x)$ |
| $\sin x$ | $= \cos(\frac{\pi}{2} - x)$ |
| $\cot x$ | $= \tan(\frac{\pi}{2} - x)$ |
| $\tan x$ | $= \cot(\frac{\pi}{2} - x)$ |
| $\csc x$ | $= \sec(\frac{\pi}{2} - x)$ |
| $\sec x$ | $= \csc(\frac{\pi}{2} - x)$ |
| $\sin(x + 2\pi)$ | $= \sin x$ |
| $\cos(x + 2\pi)$ | $= \cos x$ |
| $\tan(x + \pi)$ | $= \tan x$ |
| $\sin -x$ | $= -\sin x$ |
| $\cos -x$ | $= \cos x$ |
| $\tan -x$ | $= -\tan x$ |
| $\cos(a + b)$ | $= \cos a \cos b - \sin a \sin b$ |
| $\sin(a + b)$ | $= \sin a \cos b + \cos a \sin b$ |
| $\cos(a - b)$ | $= \cos a \cos b + \sin a \sin b$ |
| $\sin(a - b)$ | $= \sin a \cos b - \cos a \sin b$ |
| $\cos a \cos b$ | $= \frac{1}{2} \cos(a - b) + \frac{1}{2} \cos(a + b)$ |
| $\sin a \sin b$ | $= \frac{1}{2} \cos(a - b) - \frac{1}{2} \cos(a + b)$ |
| $\sin a \cos b$ | $= \frac{1}{2} \sin(a + b) + \frac{1}{2} \sin(a - b)$ |
| $\cos a \sin b$ | $= \frac{1}{2} \sin(a + b) - \frac{1}{2} \sin(a - b)$ |
| e^{ix} | $= \cos x + i \sin x$ |
| Law of Sines | $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ |
| Law of Cosines | $a^2 = b^2 + c^2 - 2bc \cos A$ |
| Law of Tangents | $\frac{a-b}{a+b} = \frac{\tan(\frac{A-B}{2})}{\tan(\frac{A+B}{2})}$ |

| Symbols | | | |
|-------------------|----------------|------------|-----------------|
| \exists | There Exists | \forall | For All |
| \therefore | Therefore | \because | Because |
| \Rightarrow | Implies | \in | Element Of |
| \wedge | And | \vee | Or |
| \Leftrightarrow | If and Only If | \propto | Proportional To |
| \cong | Congruent | \equiv | Equivalent |
| $:=$ | Defined to be | \neg | Negation |
| $\ni, , :$ | Such That | Π | Product |

| Conversion Factors | |
|---------------------|----------------------|
| 1 centimeter | 0.39 inch |
| 1 inch | 2.54 centimeters |
| 1 meter | 39.37 inches |
| 1 foot | 0.305 meter |
| 1 meter | 3.28 feet |
| 1 yard | 0.914 meter |
| 1 meter | 1.094 yards |
| 1 kilometer | 0.62 mile |
| 1 mile | 1.609 km |
| 1 square centimeter | 0.155 square inch |
| 1 square inch | 6.45 square cm |
| 1 acre | 0.405 hectare |
| 1 hectare | 2.47 acres |
| 1 square kilometer | 0.386 square mile |
| 1 square mile | 2.59 square km |
| 1 cubic centimeter | 0.06 cubic inch |
| 1 cubic inch | 16.4 cubic cm |
| 1 cubic yard | 0.765 cubic meter |
| 1 cubic meter | 1.3 cubic yards |
| 1 milliliter | 0.034 fluid ounce |
| 1 fluid ounce | 29.6 milliliters |
| 1 U.S. quart | 0.946 liter |
| 1 liter | 1.06 U.S. quarts |
| 1 U.S. gallon | 3.8 liters |
| 1 imperial gallon | 1.2 U.S. gallons |
| 1 liter | 0.9 dry quart |
| 1 dry quart | 1.1 liters |
| 1 dekaliter | 0.28 U.S. bushel |
| 1 U.S. bushel | 0.97 imperial bushel |
| 1 milligram | 0.015 grain |
| 1 grain | 64.8 milligrams |
| 1 gram | 0.035 ounce |
| 1 avoirdupois ounce | 28.35 grams |
| 1 troy pound | 0.82 pound |
| 1 kilogram | 2.205 pounds |
| 1 short ton | 0.9 metric ton |
| 1 metric ton | 1.1 short tons |

| Greek Alphabet | | |
|----------------|-----------|------------|
| Alpha | A | α |
| Beta | B | β |
| Gamma | Γ | γ |
| Delta | Δ | δ |
| Epsilon | E | ϵ |
| Zeta | Z | ζ |
| Eta | E | η |
| Theta | Θ | θ |
| Iota | I | ι |
| Kappa | K | κ |
| Lamda | Λ | λ |
| Mu | M | μ |
| Nu | N | ν |
| Xi | Ξ | ξ |
| Omicron | O | o |
| Pi | Π | π |
| Rho | P | ρ |
| Sigma | Σ | σ |
| Tau | T | τ |
| Upsilon | Y | υ |
| Phi | Φ | ϕ |
| Chi | X | χ |
| Psi | Ψ | ψ |
| Omega | Ω | ω |

Pascal's Triangle

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      1
     1 1
    1 2 1
   1 3 3 1
  1 4 6 4 1
 1 5 10 10 5 1
1 6 15 20 15 6 1

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| Combinatorics | |
|----------------|-------------------------|
| $\binom{n}{r}$ | $= \frac{n!}{(n-r)!r!}$ |
| nPr | $= \frac{n!}{(n-r)!}$ |

| Log Rules | |
|-----------------------|-------------------------------|
| $b^{\log_b x}$ | $= x$ |
| $\log_a b * \log_b x$ | $= \log_a x$ |
| $\log a + \log b$ | $= \log ab$ |
| $\log a - \log b$ | $= \log \frac{a}{b}$ |
| $n * \log a$ | $= \log(a^n)$ |
| $\log_a b$ | $= \frac{\log_c b}{\log_c a}$ |

| Constants | |
|-------------|---|
| π | 3.14159 26535 89793 23846 26433 83279 50288 41971 69399 37510 |
| π^2 | 9.86960 44010 89358 61883 44909 99876 15113 53136 99407 24079 |
| e | 2.71828 18284 59045 23536 02874 71352 66249 77572 47093 69995 |
| $\sqrt{2}$ | 1.41421 35623 73095 04880 16887 24209 69807 85696 71875 37694 |
| $\sqrt{3}$ | 1.73205 08075 68877 29352 74463 41505 87236 69428 05253 81038 |
| $\sqrt{5}$ | 2.23606 79774 99789 69640 91736 68731 27623 54406 18359 61152 |
| $\sqrt{7}$ | 2.64575 13110 64590 59050 16157 53639 26042 57102 59183 08245 |
| $\sqrt{10}$ | 3.16227 76601 68379 33199 88935 44432 71853 37195 55139 32521 |
| Φ | 1.61803 39887 49894 84820 45868 34365 63811 77203 09179 80576 |
| $\ln 2$ | 0.69314 71805 59945 30941 72321 21458 17656 80755 00134 36025 |
| $\ln 3$ | 1.09861 22886 68109 69139 52452 36922 52570 46474 90557 82274 |
| $\ln 5$ | 1.60943 79124 34100 37460 07593 33226 18763 95256 01354 26851 |
| $\ln 7$ | 1.94591 01490 55313 30510 53527 43443 17972 96370 84729 58186 |
| $\ln 10$ | 2.30258 50929 94045 68401 79914 54684 36420 76011 01488 62877 |

| Series Expansions | |
|-------------------|---|
| e^x | $= 1 + x + \frac{x^2}{2} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$ |
| $\sin x$ | $= x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \dots$ |
| $\cos x$ | $= 1 - \frac{x^2}{2} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \dots$ |
| $\ln x$ | $= 2 * [\frac{x-1}{x+1} + \frac{1}{3}(\frac{x-1}{x+1})^3 + \frac{1}{5}(\frac{x-1}{x+1})^5 + \dots]$ |
| $f(x)$ | $= \sum_{k=0}^{\infty} \frac{f^{(k)}(0)}{k!} x^k$ |

| Standard Prefixes | | |
|-------------------|------------|----|
| Yotta | 10^{24} | Y |
| Zetta | 10^{21} | Z |
| Exa | 10^{18} | E |
| Peta | 10^{15} | P |
| Tera | 10^{12} | T |
| Giga | 10^9 | G |
| Mega | 10^6 | M |
| Kilo | 10^3 | k |
| Hecto | 10^2 | h |
| Deka | 10^1 | da |
| Deci | 10^{-1} | d |
| Centi | 10^{-2} | c |
| Milli | 10^{-3} | m |
| Micro | 10^{-6} | u |
| Nano | 10^{-9} | n |
| Pico | 10^{-12} | p |
| Femto | 10^{-15} | f |
| Atto | 10^{-18} | a |
| Zepto | 10^{-21} | z |
| Yocto | 10^{-24} | y |