

## [GOOGLE](#) [GUIDE](#)

## Quick Reference: Google Calculator (Cheat Sheet)

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Solve mathematical problems with Google's built-in calculator function. Simply enter the expression you'd like evaluated in Google's web search box and hit the ENTER key or click the "Google Search" button.

### BASIC ARITHMETIC

OPERATOR	MEANING	TYPE INTO SEARCH BOX
<b>+</b> or <b>plus</b>	addition	<a href="#">12 + 34</a> or <a href="#">three plus four</a>
<b>-</b> or <b>minus</b>	subtraction	<a href="#">3.4 - 5.6</a> or <a href="#">five minus two</a>
<b>*</b> or <b>times</b>	multiplication	<a href="#">56 * 7</a> or <a href="#">six times nine</a>
<b>/</b> or <b>divided by</b>	division	<a href="#">7 / 8</a> or <a href="#">ten divided by two</a>
<b>% of</b> or <b>percent of</b>	percentage of	<a href="#">45% of 39</a>
<b>mod</b> or <b>%</b>	modulo (the remainder after division)	<a href="#">15 mod 9</a> or <a href="#">15 % 9</a>
<b>^</b> or <b>**</b>	raise to a power	<a href="#">2^5</a> or <a href="#">2**5</a>
<b>the <i>n</i>th root of</b>	<i>n</i> th root	<a href="#">4th root of 16</a> , <a href="#">sqrt(16)</a> , <a href="#">cube root of 109</a>
<b>reciprocal of</b>	multiplicative inverse	<a href="#">reciprocal of 7</a>

### ADVANCED MATH

The following table lists some of the functions built into Google's calculator.

OPERATOR	FUNCTION	TYPE INTO SEARCH BOX
sin, cos, tan, sec, csc, cot	trig functions (arguments are assumed to be in radians)	<a href="#">cos(pi/3)</a> <a href="#">cosine(pi/3)</a>
arcsin, arccos, arctan, arccsc, etc.	inverse trigonometric functions	<a href="#">arccos(.5)</a>
sinh, cosh, tanh, csch, arsinh, arccsch, etc.	hyperbolic functions	<a href="#">cosh(6)</a>
ln	logarithm base e	<a href="#">ln(16)</a>
log	logarithm base 10	<a href="#">log(16)</a>
lg	logarithm base 2	<a href="#">lg(16)</a>
exp	exponential function	<a href="#">exp(16)</a>
!	factorial	<a href="#">5!</a>
choose	<i>x</i> choose <i>y</i> calculates the number of ways of choosing a set of <i>y</i> elements from a set of <i>x</i> distinct elements	<a href="#">5 choose 3</a>

CONSTANT	MEANING	TYPE INTO SEARCH BOX
e	base of the natural system of logarithms	<a href="#">e</a>
pi	the ratio of the circumference to the diameter of a circle	<a href="#">pi/6</a>
i	imaginary number, which represents one of the two square roots of -1	<a href="#">i^2</a>
gamma	Euler's constant	<a href="#">e^gamma</a>

### TIPS (adapted from [Google's Online Calculator Help](#))

Parentheses can be used whenever they'll serve to make complicated expressions unambiguous, and also sets of parentheses can be used within parentheses; don't use brackets for grouping.

You can force the calculator to try to evaluate an expression by putting an equals sign (=) after it. This works only if the expression is arithmetically computable. For example, [1-800-555-1234=](#) will return a result, but [1/0=](#) will not (because dividing a non-zero number by zero is undefined and not computable).

Parentheses can be used to enclose the parts of your expression that you want evaluated first. For example, [\(1+2\)\\*3](#) causes the addition to happen before the multiplication.

Google's calculator automatically balances unclosed parentheses.

A missing operator within an expression may default to an \*, e.g., [6cos\(2pi\)](#).

Feel free to experiment with the calculator as not all of its capabilities are listed here.

## UNITS OF MEASURE AND CONVERSIONS

Compute expressions involving different units. By default, units are converted to and results expressed in meter-kilogram-second (mks) units. Many units have both long and short names. Use whichever name you prefer.

TYPE OF UNITS	UNIT CONVERSION	EXAMPLES OF UNITS
	<i>old units in new units</i>	
Mass	<a href="#">130 lbs in kg</a>	kilogram or kg, grams or g, grains, pounds or lbs, carats, stones, tons, tonnes, etc.
Length	<a href="#">3 miles in km</a>	meters or m, miles, feet, Angstroms, cubits, furlongs, etc.
Volume	<a href="#">three quarters of a cup in teaspoons</a>	gallons, liters or l, bushels, teaspoons, pints, etc.
Area	<a href="#">2 acres in sq km</a>	square kilometers, acres, hectares, etc.
Temperature	<a href="#">98.6 Fahrenheit in Celsius</a> or <a href="#">98.6 f in c</a>	Celsius or c, Fahrenheit or f
Time	<a href="#">1 year in seconds</a>	days, seconds or s, centuries, sidereal years, fortnights, etc.
Electricity	<a href="#">100 volts in picovolts</a>	volts or v, picovolts, amps or a, ohms, henrys, etc.
Energy	<a href="#">160 lbs * 4000 ft in Calories</a>	Calories, British thermal units (BTU), joules, ergs, foot-pounds, etc. ( <i>Warning: When your query includes "Calories" with a capital "C," Google returns kilocalories called "calories" by nutritionists.</i> )
Power	<a href="#">1 hp in watts</a> , <a href="#">500 V * 3 A in KW</a>	watt or W, kilowatts or KW, megawatts or MW, horsepower or HP, etc.
Angle	<a href="#">90 degrees in radians</a>	degrees or radians
Information	<a href="#">2 bytes in bits</a>	bits, bytes, kbytes, etc.
Quantity	<a href="#">1 great gross in dozens</a>	dozen, baker's dozen, gross, great gross, score, etc.
Numbering Systems	<a href="#">1500 in hex</a>	decimal, hexadecimal or hex, octal, binary, roman numerals, etc. (Prefix hexadecimal numbers with 0x, octal numbers with 0o and binary numbers with 0b, e.g., <a href="#">0x7f + 0b100101</a> )
	<a href="#">64 in binary</a>	
	<a href="#">LVII in decimal</a>	

## PHYSICAL CONSTANTS

The following table lists just a few of the many commonly used physical constants known to the calculator function.

SHORTHAND NOTATION	LONG NAME	CLICK LINK FOR AN APPROXIMATE VALUE
<b>au</b>	Astronomical Unit	<a href="#">au</a> or <a href="#">astronomical unit</a>
	Avogadro's number	<a href="#">Avogadro's number</a>
<b>k</b>	Boltzmann constant	<a href="#">k</a> or <a href="#">Boltzmann constant</a>
	Faraday constant	<a href="#">Faraday constant</a>
<b>G</b>	gravitational constant	<a href="#">G</a> or <a href="#">gravitational constant</a>
	magnetic flux quantum	<a href="#">magnetic flux quantum</a>
	mass of a proton	<a href="#">mass of a proton</a>
<b>m_planet</b>	mass of <i>planet</i>	<a href="#">m_Mars</a> , <a href="#">m_Earth</a> , <a href="#">m_Uranus</a> , <a href="#">m_sun</a>
	molar gas constant	<a href="#">molar gas constant</a>
<b>h</b>	permeability of free space	<a href="#">permeability of free space</a>
	Planck's constant	<a href="#">h</a> or <a href="#">Planck's constant</a>
<b>r_planet</b>	radius of <i>planet</i>	<a href="#">r_Earth</a> , <a href="#">r_Pluto</a> , <a href="#">r_sun</a>
<b>c</b>	speed of light in a vacuum	<a href="#">c</a> or <a href="#">speed of light</a>
	speed of sound in air at sea level	<a href="#">speed of sound</a>



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