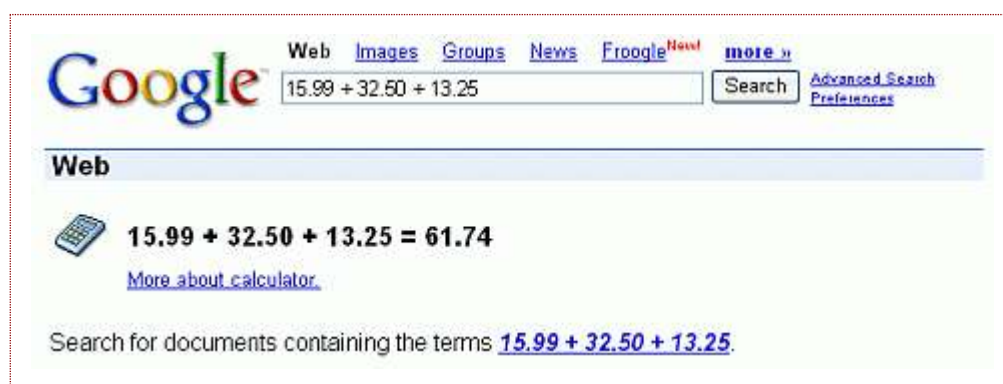


? GoogleGuide making searching even easier

Shortcut: Calculator

Want to add up a list of numbers, convert from miles to kilometers, or evaluate some other mathematical expression? Instead of using a piece of paper, your calculator, or a computer math software program, you can now 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 click the **ENTER** key or click the [Google Search](#) button.



The [Google Guide Calculator Reference](#) provides a nice summary of some of Google's calculator features.

Once you have a result, you can use your browser's Copy feature (usually on its Edit menu) to copy the result. Then you can paste it into another program, a box in a form on another web page, and so on.

The calculator can evaluate mathematical expressions involving Basic Arithmetic, Advanced Math, Units of Measure and Conversions, and Physical Constants. Let's see details about each of these.

1. Basic Arithmetic

Compute expressions containing standard mathematical symbols. The following table lists operators that come between the two numbers on which they operate, e.g., to multiply 2 times 3, use `2 * 3`.

Operator	Function	Example
+	Addition	[15.99 + 32.50 + 13.25]
-	Subtraction	[79 - 18 - 19]
*	Multiplication	[2 * 3 * 7]
/	Division	[378 / 9]
^ or **	Exponentiation (raise to a power of)	[4^10] or [4**10]

% of	Percent	[15% of 93.45]
mod or %	modulo (the remainder after division)	[15 mod 9] or [15 % 9]
the ζ th root of	calculates the ζ th root	[4th root of 16]; [cube root of 109]; [square root of 42] or [sqrt(42)]

Note: To do multiplication, you must include the * symbol; [$3 * 4$] will be calculated, $3 4$ won't.

2. Advanced Math

Compute results involving mathematical constants, such as π , e , i (the square root of -1), and mathematical functions. The following table lists just some of the functions built into Google's calculator.

Operator	Function	Example
sin, cos, tan, sec, csc, cot, etc.	Trigonometric functions (arguments are assumed to be in radians)	[cos(pi/6)]; [cosine(pi/6)]
arcsin, arccos, arctan, arccsc, etc.	Inverse trigonometric functions	[arccos(.5)]
sinh, cosh, tanh, csch, arsinh, arccsch, etc.	Hyperbolic functions	[cosh(6)]
ln	Logarithm base e	[ln(16)]
log	Logarithm base 10	[log(16)]
lg	Logarithm base 2	[lg(16)]
exp	Exponential function	[exp(16)]
!	Factorial	[5!]
choose	x choose y calculates the number of ways of choosing a set of y elements from a set of x distinct elements	[5 choose 3]

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

Name and description	Example
base of the natural system of logarithms	[e]
π , the ratio of the circumference to the diameter of a circle	[pi/6]
imaginary number, i , which represents one of the two square roots of -1	[i^2]
Euler's constant, gamma	[e^gamma]

3. 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	Examples
Currency	Australian Dollars (AUD), British pounds (GBP), Euros, US Dollars (USD)
Mass	kilogram or kg, grams or g, grains, pounds or lbs, carats, stones, tons, tonnes
Length	meters or m, miles, feet, Angstroms, cubits, furlongs
Volume	gallons, liters or l, bushels, teaspoons, pints
Area	square kilometers, acres, hectares
Time	days, seconds or s, centuries, sidereal years, fortnights
Electricity	volts, amps, ohms, henrys
Energy	Calories, British thermal units (BTU), joules, ergs, foot-pounds
Power	watt, kilowatts, horsepower or hp
Information	bits, bytes, kbytes, etc.
Quantity	dozen, baker's dozen, percent, gross, great gross, score, googol
Numbering systems	decimal, hexadecimal or hex, octal, binary, roman numerals, etc. Prefix hexadecimal numbers with 0x, octal numbers with 0o and binary numbers with 0b. For example: 0x7f + 0b10010101.

Here are calculations that involve units.

- [[2 meters + 5 feet](#)]

Convert from one set of units to another by using the notation, *x units to y units*.

- [[three quarters of a cup in teaspoons](#)]
- [[98.6 degrees Fahrenheit in degrees Celsius](#)]
- [[130 lbs in kg](#)]
- [[130 lbs in stones](#)]
- [[65 mph in kph](#)] or
- [[65 mph in km/h](#)]

Warning: When your query includes "Calories" with a capital "C," Google returns kilocalories called "calories" by nutritionists.

- [[160 pounds * 4000 feet in Calories](#)]

Convert from one numbering system to another.

- [[1500 in hex](#)] or [[1500 in hexadecimal](#)]
- [[64 in binary](#)]
- [[LVII in decimal](#)]

In many cases, you can also get the conversion factor between units:

- [[meters per mile](#)]
- [[furlongs per fortnight](#)]

That last conversion is a common joke among engineers — though, as Jim Jardine points out, "There is no reason to denigrate neither furlongs nor fortnights as they are both very easily defined measurements." (See

his page [Furlongs Today](#).)

4. Physical Constants

The following table lists just a few of the many commonly used physical constants known to the calculator function. Parts of this table were adapted from the table at the end of David W. Ward's article [Physics the Google Way](#).

Note: Sometimes Google's calculator interprets lower case letters different from upper case letters.

Long Name	Shorthand Notation	Click the Link for the Approximate Value
atomic mass units	amu	[amu] or [atomic mass unit]
Astronomical Unit	au	[au] or [astronomical unit]
Avogadro's number		[N_A] or [Avogadro's number]
Boltzmann constant	k	[k] or [Boltzmann constant]
electric constant, permittivity of free space		[epsilon_0]
electron mass		[m_e] or [electron mass]
electron volt	eV	[eV] or [electron volt]
elementary charge		[elementary charge]
Euler's constant		[Euler's constant]
Faraday constant		[Faraday constant]
fine-structure constant		[fine-structure constant]
gravitational constant	G	[G] or [gravitational constant]
magnetic flux quantum		[magnetic flux quantum]
mass of each planet and of the sun		[m_mars], [m_earth], [m_uranus], ..., [m_sun]
molar gas constant		[molar gas constant]
permeability of free space		[permeability of free space]
Planck's constant	h	[h] or [Planck's constant]
proton mass		[m_p] or [proton mass]
radius of each planet and of the sun		[r_earth], [r_pluto], ..., [r_sun]
Rydberg constant		[Rydberg constant]
speed of light in a vacuum	c	[c] or [speed of light]
speed of sound in air at sea level		[speed of sound]
Stefan-Boltzmann constant		[Stefan-Boltzmann constant]

Here are some calculations using built-in constants.

- [[1 AU/c](#)]
- [[1.21 MW / 88 mph](#)]

- [$(G * \text{mass of earth}) / (\text{radius of earth} ^ 2)$]

5. Using Parentheses

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.

The following are tips from Google's online help for the calculator, which can be found on the web at www.google.com/help/calculator.html.

- 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= (a US phone number followed by an equals sign) will return a result, but 1/0= will not.
- 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.

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

6. Soople

If you want a visual interface to some of the capabilities of Google's calculator, visit Soople's Calculator page, www.soople.com/soople_intcalchome.php.

The screenshot shows the Soople website interface with a navigation bar and several calculator tools. The navigation bar includes "SEARCH GOOGLE" and "ABOUT SOOPLE" tabs, and a "Make Soople your homepage" button. Below the navigation bar are links for "Main Page", "-Calculator-", "Translate", "Phone & Location", and "Superfilter".

The main content area features several calculator tools, each with an icon and a "Calculate" button:

- Smart calculator**: Includes a tip: "Tip: Convert many measures/units Like '15 yards in meters'".
- Quick unit converter**: Includes fields for "Number", "Choose unit", and "in: Choose unit".
- Add, subtract, divide & multiply**: Includes fields for "enter number" and a dropdown for the operator.
- Calculate the percentage of...**: Includes fields for "enter a number", "percent of:", and "enter a number".
- Trigonometric functions**: Includes a dropdown for the function (e.g., "Sinus") and a field for "enter a number". Note: "Note: numbers are assumed to be radians otherwise type 'degrees' after the number".
- # root of...**: Includes a dropdown for "Choose root" and a field for "enter a number".
- ln (logarithm base e)**: Includes a field for "enter a number".
- log (logarithm base 10)**: Includes a field for "enter a number".
- Find the remainder after division**: Includes fields for "Divide: enter a number" and "by: enter a number".
- Choose: determine the number of ways of choosing**: Includes fields for "enter a number", "choose", and "enter a number".

Exercises

This problem set is designed to give you practice in using Google's new calculator function. For hints and answers to selected problems, see the [Solutions](#) page.

1. Convert 1 mile to meters.
2. Convert 1 kg (kilogram) to lbs (pounds).
3. Convert 0 degrees Kelvin to Fahrenheit or Celsius.
4. Compute the number of minutes in a 365-day year.
5. Which is larger e^{π} or π^e ? The same relationship holds between x^e and e^x for all non-negative values of x except e . The exponential constant, e , is approximately 2.72 and the ratio of the circumference to the diameter of a circle, π , is approximately 3.14.
6. How many lottery combinations are there if the winning combination consists of 5 distinct integers between 1 and 99, i.e., there are 99 balls in an urn and once one is selected, it isn't returned to the box.
7. Compute the probability of your winning the lottery if you buy 1,000 tickets each bearing five distinct independently randomly chosen integers between 1 and 99.

tags (keywords): [calculator](#), [queries](#), [shortcuts](#), [soople](#), [tools](#)

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