TOOLARITHM / FORMULA SHEETS

Unit conversion sheet

Exact factors and temperature offsets

Factors use the international inch, foot and avoirdupois pound. Squared quantities need squared length factors. Binary storage prefixes are distinct from decimal SI prefixes.

Inches to centimetres

$$1\,\text{in} = 2.54\,\text{cm}$$

Exact international-inch definition. Multiply an inch value by this factor to obtain centimetres; divide to reverse the conversion.

Square feet to square metres

$$1\,\text{ft}^2 = 0.09290304\,\text{m}^2$$

Exact, from $1\,\text{ft} = 0.3048\,\text{m}$. Square the length factor for area. This is not the historical US survey foot.

Litres to cubic centimetres

$$1\,\text{L} = 1000\,\text{cm}^3$$

Also $1\,\text{mL} = 1\,\text{cm}^3$ exactly. Volume does not determine mass without a density for the material and its conditions.

Fahrenheit to Celsius

$$T_C = \frac{5}{9}(T_F - 32)$$

T_F and T_C are numerical temperature readings on the Fahrenheit and Celsius scales. For a temperature difference, use $\Delta T_C = 5\Delta T_F/9$ without the offset.

Pounds of mass to kilograms

$$1\,\text{lb} = 0.45359237\,\text{kg}$$

Exact for the international avoirdupois pound of mass. A pound-force is a force unit and requires a different conversion.

Binary storage to bytes

$$1\,\text{GiB} = 2^{30}\,\text{B}$$

Exactly $1\,073\,741\,824$ bytes. By contrast, $1\,\text{GB} = 10^9\,\text{B}$. A byte contains eight bits; keep the unit label with the number.

Worked example / Convert an area without a linear-factor error

Convert $12\,\text{ft}^2$ to square metres using the international foot. Display the final result to four decimal places.

1. Square the exact length conversion factor.

$$(0.3048)^2 = 0.09290304$$

2. Apply that area factor and retain all intermediate digits.

$$12 \times 0.09290304 = 1.11483648$$

3. Attach the square unit and round the final display.

$$12\,\text{ft}^2 \approx 1.1148\,\text{m}^2$$

The exact factor does not add precision to a measured input. Four decimal places here are a requested display choice, not a claim about measurement uncertainty.

Source checks & next step

NIST: SI conversion factors / NIST: binary prefixes

Check an area conversion / Full previews and sources: toolarithm.com/resources/formula-sheets