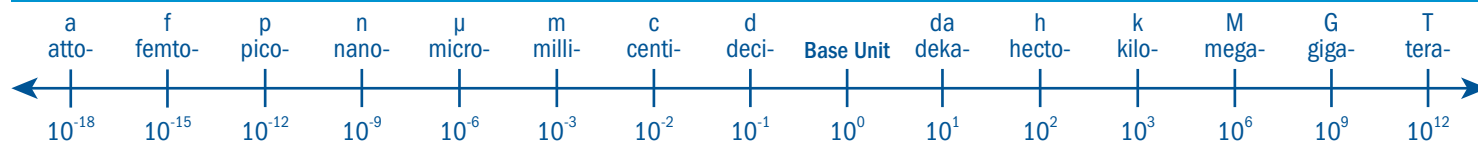


Unit conversion

Metric system



Example: Convert the following:

a) Convert 5.2 mg to kg

$$(5.2 \text{ mg}) \left(\frac{1 \text{ g}}{10^3 \text{ mg}} \right) \left(\frac{1 \text{ kg}}{10^3 \text{ g}} \right) = 5.2 \times 10^{-6} \text{ kg}$$

b) Convert 0.00071 km to μm

$$(7.1 \times 10^{-5} \text{ km}) \left(\frac{10^3 \text{ m}}{1 \text{ km}} \right) \left(\frac{10^6 \mu\text{m}}{1 \text{ m}} \right) = 7.1 \times 10^4 \mu\text{m}$$

SI units		
QUANTITY	UNIT	SYMBOL
Length	Metre	m
Mass	Kilogram	kg
Time	Second	s
Electric charge	Coulomb	C
Temperature	Kelvin	K
Amount of substance	Mole	mol

Common combinations of the SI units					
DERIVED QUANTITY	NAME	SYMBOL	EQUIVALENT SI UNITS	QUANTITY	UNIT
Force ($F = ma$)	Newton	N	$\frac{\text{kg} \cdot \text{m}}{\text{s}^2}$	Area	m ²
Work ($W = Fd$)	Joule	J	$\text{N} \cdot \text{m}, \frac{\text{kg} \cdot \text{m}^2}{\text{s}^2}$	Volume	m ³
Power ($P = W/t$)	Watt	W	$\text{J/s}, \frac{\text{kg} \cdot \text{m}^2}{\text{s}^3}$	Velocity	m/s
Current ($I = Q/t$)	Ampere	A	C/s	Acceleration	m/s ²

Example: Convert the following to appropriate SI Units:

a) 10 km/h

$$\left(10 \frac{\text{km}}{\text{h}} \right) \left(\frac{1 \text{ h}}{3600 \text{ s}} \right) \left(\frac{1000 \text{ m}}{1 \text{ km}} \right) = 2.8 \frac{\text{m}}{\text{s}}$$

b) 450 cm²

$$(450 \text{ cm}^2) \left(\frac{1 \text{ m}}{100 \text{ cm}} \right) \left(\frac{1 \text{ m}}{100 \text{ cm}} \right) = 0.045 \text{ m}^2$$

Converting between degrees and radians

Example: Perform the following conversions:

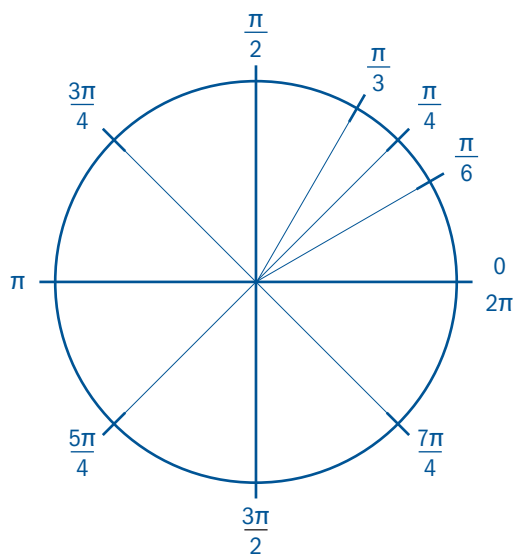
- 180° = π rad
- Radians are dimensionless

a) Convert 45° to radians

$$45^\circ \left(\frac{\pi \text{ rad}}{180^\circ} \right) = \frac{\pi}{4} \text{ rad}$$

b) Convert $\frac{4}{3}\pi$ rad to degrees

$$\frac{4}{3}\pi \text{ rad} \left(\frac{180^\circ}{\pi \text{ rad}} \right) = 240^\circ$$



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