

Appendix

Conversion tables

LENGTH

Système International (SI)

The following measurements are equivalent:

millimetre (mm)	1000
centimetre (cm)	100
decimetre (dm)	10
metre (m)	1
decametre (dam)	0.1
hectometre (hm)	0.01
kilometre (km)	0.001

Imperial

1 ft	12 in
1 yd	3 ft
1 mi	1760 yd

SI to imperial

1 mm	0.0394 in
1 cm	0.394 in
1 m	1.094 yd
1 km	0.621 mi

Imperial to SI

1 in	2.54 cm
1 ft	0.305 m
1 yd	0.915 m
1 mi	1.61 km

MASS

SI

1 kg	1000 g
1 tonne	1000 kg

Imperial

1 lb	16 oz
1 ton	2240 lb

SI to imperial

1 kg	2.20 lb
1 tonne	0.984 ton

Imperial to SI

1 lb	0.454 kg
1 ton	1.02 tonne

TEMPERATURE

SI to imperial

$$F = \frac{9}{5}C + 32$$

Imperial to SI

$$C = \frac{5}{9}(F - 32)$$

VOLUME

SI

1 litre	1000 mL
1 mL	1 cm ³

Imperial

1 pint	16 oz
1 qt	2 pints
1 gal (US)	4 qt

SI to imperial

1 mL	0.0352 oz
1 L	0.264 gal (US)

Imperial to SI

1 oz	28.4 mL
1 pint	0.568 L
1 qt	0.946 L
1 gal (US)	3.79 L

Reference sheet

Linear Relations

Slope:

$$m = \frac{\text{rise}}{\text{run}}$$

$$m = \frac{\Delta y}{\Delta x}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Direct linear relation: $y = mx$

Partial linear relation: $y = mx + b$

Tolerance

Ways of expressing manufacturing tolerances:

maximum value
minimum value

nominal value $\pm \frac{1}{2}$ (tolerance)

minimum value $^{+tolerance}_{-0}$

maximum value $^{+0}_{-tolerance}$

Statistics

Mean:

$$\bar{x} = \frac{\text{sum of values}}{\text{number of values}}$$

Percentile ranking:

$$PR = \frac{b}{n} \times 100$$

Probability

Probability:

$$P(A) = \frac{\text{number of occurrences of event } A}{\text{total number of possible outcomes}}$$

Odds

odds in favour =

favourable outcomes:unfavourable outcomes

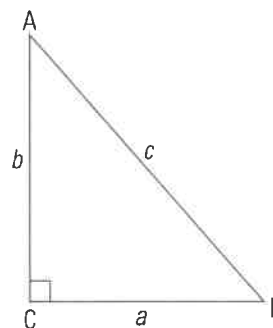
odds against =

unfavourable outcomes:favourable outcomes

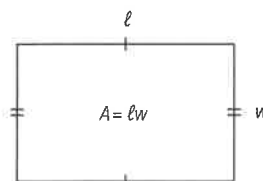
Geometry

Pythagorean theorem:

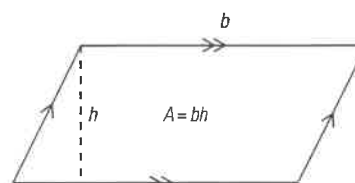
$$a^2 + b^2 = c^2$$



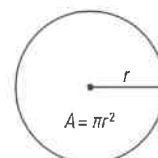
Area of geometric figures:



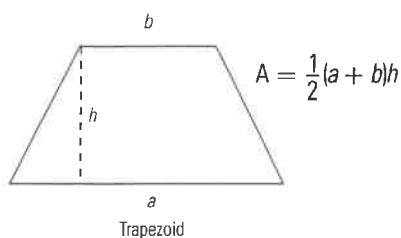
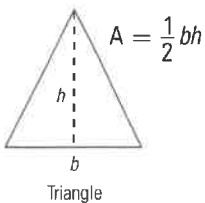
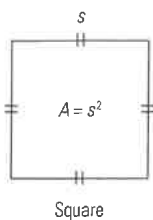
Rectangle



Parallelogram

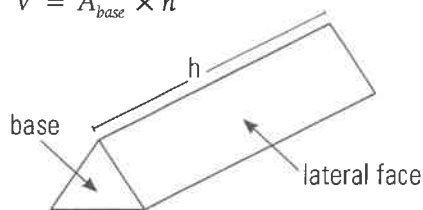


Circle



Volume of prism:

$$V = A_{\text{base}} \times h$$



Polygons

sum of interior angles = $180^\circ(n - 2)$

Trigonometry

Primary trigonometric ratios:

$$\sin \theta = \frac{\text{opposite side}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent side}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite side}}{\text{adjacent side}}$$

Sine law:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Cosine law:

$$a^2 = b^2 + c^2 - 2bc \cos A \quad \text{or}$$

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

Compound interest

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

where:

A is the amount of money you have to repay for the loan.

P the principal.

r is the annual interest rate as a decimal.

n is the number of compounding periods per year.

t is the term of the loan in years.

