



## USEFUL CONVERSIONS & FORMULAS

### METRIC CONVERSION TABLE

Approximate Conversions to metric measures

<i>when you Know</i>	<i>Multiply by</i>	<i>To Find</i>	<i>Symbol</i>
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#### LENGTH

inches	2.5	centimetres	cm
feet	0.3	metres	m
yards	0.9	metres	m
miles	1.6	kilometres	km

#### AREA

square inches	6.5	square centimetres	cm <sup>2</sup>
square feet	0.09	square metres	m <sup>2</sup>
square yards	0.8	square metres	m <sup>2</sup>
square miles	2.6	square kilometres	km <sup>2</sup>
acres	0.4	hectares	ha

#### MASS

ounces	28	grams	g
pounds	0.45	kilograms	kg
short tons (2000 lb.)	0.9	tonnes	1

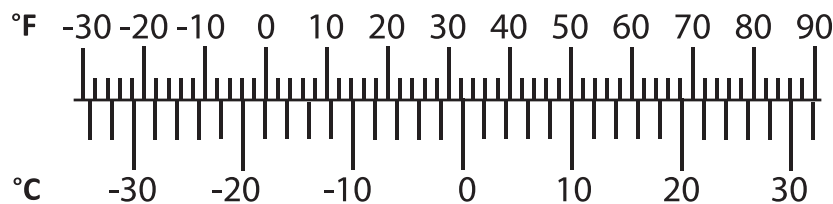
#### VOLUME

fluid ounces	28	millilitres	mL
pints	0.57	litres	L
quarts	1.14	litres	L
gallons	4.5	litres	L
cubic feet	0.03	cubic metres	m <sup>3</sup>
cubic yards	0.76	cubic metres	m <sup>3</sup>

#### TEMPERATURE (EXACT)

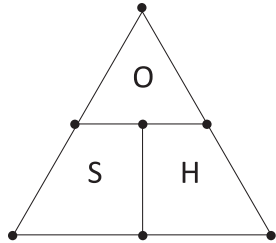
Fahrenheit                      Celsius                      °C

$$^{\circ}\text{F} - 32 \times 5/9 = ^{\circ}\text{C}$$





## SOH-CAH-TOA

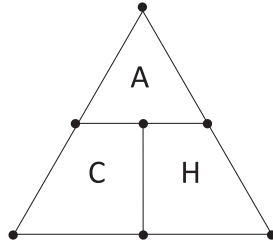


Angle = Inverse Sin(O/H)

$$O = H * \text{Sin}(\text{angle})$$

$$H = O / \text{Sin}(\text{angle})$$

Sin is short for Sine  
Use when no A

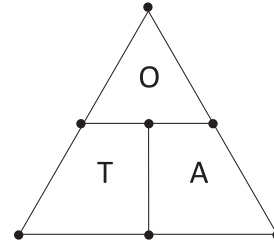


Angle = Inverse Cos(A/H)

$$A = H * \text{Cos}(\text{angle})$$

$$H = A / \text{Cos}(\text{angle})$$

Cos is short for Cosine  
Use when no O



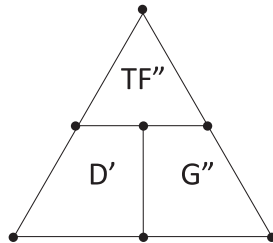
Angle = Inverse Tan(O/A)

$$O = A * \text{Tan}(\text{angle})$$

$$A = O / \text{Tan}(\text{angle})$$

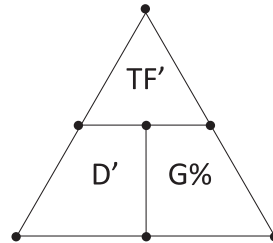
Tan is short for Tangent  
Use when no H

## TOTAL FALL / DISTANCE / GRADE



Distance in feet

Grade in fraction of an inch

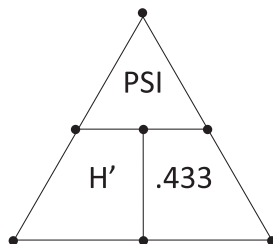


Total Fall in feet

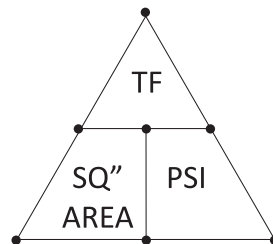
Distance in feet

Grade in percentage

## PSI / TOTAL FORCE



PSI



TOTAL FORCE



## USEFUL CONVERSIONS & FORMULAS

### Perimeter, Area, Volume, and Length Constants

6.24 imp gallons in a cubic foot  
7.48 US gallons in a cubic foot  
220.33 imp gallons in a cubic meter  
264.39 US gallons in a cubic meter  
4.546 litres in an imp gallon  
3.785 litres in a US gallon  
1 cubic inch of water weighs 0.0361 lbs  
1 imp gallon of water weighs 10 lbs  
1 US gallon weighs 8.327 lbs  
1 cubic foot of water weighs 62.4 lbs  
1 cubic meter of water weighs 2203.3 lbs  
1 imp gallon = 1.2 US gallons  
1 imp gallon of water = 277 cubic inches  
1 US gallon = 231 cubic inches  
1 pound (lb) = 0.455 kg  
1 Kg = 2.2 pounds (lbs)  
1 foot head of water = 0.433 PSIG  
1 meter head of water = 1.42 PSIG  
2.31 foot head of water = 1 PSIG  
0.704 meter head of water = 1 PSIG  
1 atmosphere = 14.73 PSIA absolute  
1 inch of mercury = 0.491 PSIG  
1 PSI = 2.035 inches of mercury  
1 PSI = 28 inches of water column  
1 atmosphere = 29.92 inches of mercury  
1 inch = 2.54 cm  
1 foot = 30.48 cm  
3.28 feet = 1 m  
1 square foot = 144 square inches  
1 square foot = 929.03 square centimeters  
1 cubic foot = 1728 cubic inches  
1 cubic foot = 0.0283 cubic meters  
1 square meter = 10.76 square feet  
1 cubic meter = 35.31 cubic feet

### Trigonometry Constants

22.5° - Travel = Offset x 2.613  
22.5° - Travel = Advance x 1.08  
22.5° - Advance = Offset x 2.41  
22.5° - Advance = Travel x 0.924  
45° - Travel = Offset or Advance x 1.414  
45° - Offset or Advance = Travel ÷ 1.414  
45° - Step ahead = Spread x 0.414  
60° - Travel = Offset x 1.155  
60° - Travel = Advance x 2  
60° - Advance = Offset x 0.58  
60° - Advance = Travel x 0.5  
60° - Offset = Advance x 1.73  
60° - Offset = Travel x 0.87  
60° - Step ahead = Spread x 0.58

### BTU Constants

0.53 BTU's to raise 1 lb of ice 1 degree  
0.48 BTU's to raise 1 lb of steam 1 degree  
1 BTU to raise 1 lb of water 1 degree  
144 BTU's for latent heat of fusion  
970.4 BTU's for latent heat of vaporization  
1 BTU - 1.055 Kilojoules



### Formulas

Volume of a cylinder =  $D^2 \times 0.7854 \times H$

Area of a cylinder or pipe =  $\pi \times D \times H$

Area of a cylinder and ends =  $(\pi \times D \times H) + (2 \times D^2 \times 0.7854)$

Area of a circle =  $D^2 \times 0.7854$  or  $\pi \times R^2$

Volume of a cube =  $L \times W \times H$

Area of a square =  $L \times W$

Area of a cube =  $6 \times (L \times W)$

Area of a triangle =  $1/2 \text{ base} \times H$

Circumference =  $\pi \times D$

Perimeter of a square or rectangle =  $L \times 2 + W \times 2$

Perimeter of any other shape = total length of all sides added together

Imperial gallons in a cylinder =  $D^2 \times 0.7854 \times H \times 6.24$  with dimensions in feet

US gallons in a cylinder =  $D^2 \times 0.7854 \times H \times 7.48$  with dimensions in feet

Imperial gallons in a cylinder =  $D^2 \times 0.7854 \times H \times 220.33$  with dimensions in meters

US gallons in a cylinder =  $D^2 \times 0.7854 \times H \times 264.39$  with dimensions in meters

Fahrenheit to Celsius -  $C^\circ = (F^\circ - 32) \div 1.8$

Celsius to Fahrenheit -  $F^\circ = (C^\circ \times 1.8) + 32$

Linear Expansion = length x temperature differential x C.O.E. (co-efficient of expansion)

PSI = Height in feet x 0.433

PSI = Height in meters x 1.42

Total force = Area x Pressure

Right angle triangles =  $A^2 + B^2 = C^2$

$$A = \sqrt{C^2 - B^2}$$

$$B = \sqrt{C^2 - A^2}$$

$$C = \sqrt{A^2 + B^2}$$

