

## CUSTOMARY/ METRIC CONVERSIONS (APPROXIMATE)

Customary		Metric	Metric		Customary
Inches (in)	x	25.4 = millimeters	millimeters (mm)	x	.04 = inch
Feet (ft)	x	.3 = meter	Meters (m)	x	3.3 = feet
Yards (yd)	x	.9 = meter	Meters (m)	x	1.1 = yards
Miles (ml)	x	1.6 = Kilometers	Kilometers (km)	x	.6 = mile
Square inches (in <sub>2</sub> )	x	6.5 = sq centimeters	Sq centimeters (cm <sub>2</sub> )	x	.2 = sq. inch
Square feet (ft <sub>2</sub> ) =sq. feet	x	.1 = sq meter	Square meters (m <sub>2</sub> )	x	10.8
Square yards (yd <sub>2</sub> )	x	.8 = sq meter	Square meters (m <sub>2</sub> )	x	1.2 =sq yards
Acres	x	.4 = hectare	Hactares (ha)	x	2.5 =acres
Cubic feet (cu ft)	x	.03 = cu meter	Cu meters (m <sub>3</sub> )	x	35.3 =cu feet
Cord (cd)	x	3.6 = cu meter	Liters (l)	x	1.1 =quarts(ql)
Quarts (1q) (qt)	x	.9 = liter	Cu meters (m <sub>3</sub> )	x	284.2 = gallons
Gallons (gal)	x	.004 = cu meters	Grams (g)	x	.04 = ounce(avdp)
Ounces (avdp) (oz)	x	28.4 = grams	Kilograms	x	2.2 = pounds(avdp)
Pounds (avdp) (lb)	x	.5 = kilogram	Kilowatts (kW)	x	1.3 = horsepower
Horsepower (hp)	x	.7 = kilowatt	Degrees Celsius	x	9/5+32 = degrees Fahrenheit
Degress Fahrenheit (-32)	x	5/9 = degrees Celsius			

### Units of Length and Area

Customary		Metric	Metric		Customary
Inch (in)	=	= 25.4 millimeters	Millimeter (mm)	=	.001 meter = .039 in.
Foot (ft)	=	12 in = .305 meter	Centimeter (cm)	=	.01 meter = .394 in.
Yard (yd)	=	36 in or 3ft = .914 meter	Decimeter (dm)	=	.1 meter =3.937 in.
Mile (ml)	=	5,280 ft. =1.609	meter (m)	=	=3.291 ft.
In <sub>2</sub> (sq in)	=	= 6.452 cm <sub>2</sub>	Kilometer (km)	=	1,000meters=.621 mile
Ft <sub>2</sub> (sq ft)	=	144sq ft =.093m <sub>2</sub>	Sq millimeter (mm <sub>2</sub> )	=	.000001 m <sub>2</sub> =.002sq in.
Yd <sub>2</sub> (sq yd)	=	1,296 sq ft =.836m <sub>2</sub>	Sq centimeter (cm <sub>2</sub> )	=	.0001 m <sub>2</sub> =.155sq in.
		Or 9 sq ft.	Sq decimeter (dm <sub>2</sub> )	=	01 m <sub>2</sub> = 15.5 sq in.
Acre	=	43,560 sq ft. = .405 ha	Sq meter (m <sub>2</sub> )	=	= 10.864 sq ft.
Mile <sub>2</sub> (sq mi)	=	640 acres = 2.59 km <sub>2</sub>	Heclare (ha)	=	10,000m <sub>2</sub> = 2.471 acres
			Sq kilometer (km <sub>2</sub> )	=	1,00,000m <sub>2</sub> = .386 sq ml

## Units of Weight (or Mass)

Customary	Metric	Metric	Customary
	Avoirdupois'		
Grain	=	=.065 gram	Gram (g) = .035 oz avdp
Ounce (oz advp)	=	437.5 grain =28.350 grams	or .032 oz troy
Pound (lb Advp)	=	7,000 grains =.454 kilograms	10g = .353 oz avdp or .322 oz troy
Hundredweight (cwt)	=	100 pounds = 45.359 kg	10g = 3.527 oz avdp or 3.215 oz troy
Ton, Short (tn)	=	2,000 pounds = .907 metric ton	
Ton, long	=	2,240 pounds = 1.016 metric tons	Kilogram (kg) 1,000 g.= 2.205 lb avdp or 2.679 lb troy
Ounce (oz troy)	=	Troy_ 480 grains = 31.104 grams	Metric ton 1,000kg=1.102 short tons
Pound (lb troy)	=	5,760 grains =.373 kilograms	or .984 long ton
		Or 12 ounces	

\_For weighing ordinary commodities.    \_For weighing precious metals, jewels, etc.    \_Also known as fine ounces.

## Units of Capacity

Customary	Metric	Metric	Customary
	Liquid		Dry
Fluid ounce (fl oz)	=	29.573 ml	pint (pt) = .551 dm_
Pint (pt)	=	16 fl oz = .473 liter	Quart (qt) 2 pints = 1.101 dm_
Quart (qt)	=	32 fl oz or 2 pt. = .946 liter	Peck (pk) 8 quarts = 8.810 dm_
Gallon (gal)	=	8 pt or 4qt. = 3.785 liters	Bushel (bu) 32 quarts = 35.238 dm_
	Metric		Customary
	Milliliter (ml) = .001 liter	= .034 fl oz (liquid)	= .002 pt (dry)
	Liter (l)	= 1.057 qt (liquid)	= .908 qt (dry)
	Hectoliter (hl) = 100 liter	=26.418 gal (liquid)	= 2.838 qt (dry)

## Geometric Formulas

### Circle

area	= $\frac{1}{2}$ diameter x $\frac{1}{2}$ circumference
area of sector	= length of arc x $\frac{1}{2}$ radius
area of segment which is greater than semicircle	= area of sector of equal radius plus area of triangle
area of segment which is less than semicircle	= area of sector of equal radius minus area of triangle
circumference	= diameter x 3.1416
	= radius x 6.283185
	= circumference x .3183
	= circumference x .0159155
diameter	
radius	
<b>Cylinder or Prism</b>	
surface	= (area of both ends) + (length x circumference)
<b>Ellipse</b>	
area	= product of the two diameters x .7854
<b>Parabola</b>	
area	= $\frac{2}{3}$ altitude x base
<b>Parallelogram</b>	
area	= altitude x base
<b>Polygon (Regular)</b>	
area	= sum of sides x perpendicular from center to one of sides $\div$ 2
<b>Pyramid or Cone</b>	
surface	= circumference of base x $\frac{1}{2}$ slant height + area of base
contents	= $\frac{1}{3}$ altitude x area of base
<b>Rectangle</b>	
area	= length x width
<b>Sphere</b>	
circumference	= cube root of solidity x 3.8978
	= square root of surface x 1.772454
	= diameter x .5236
	= (height squared + three times the square of radius of base) x (height x .5236)
	= square root of surface x .56419
	= cube root of solidity x 1.2407
	= circumference x diameter
	= surface x $\frac{1}{6}$ diameter
	= diameter cubed x .5236
	= radius cubed x 4.1888
	= circumference cubed x .016887
contents	
contents of segment	
diameter	
surface	
volume	
<b>Square</b>	
area	= length x width
<b>Trapezium</b>	
area	= divide trapezium into triangles; add their areas
<b>Trapezoid</b>	
area	= altitude x $\frac{1}{2}$ sum of parallel sides
<b>Triangle</b>	
area	= $\frac{1}{2}$ altitude x base
<b>Wedge</b>	
contents	= $\frac{1}{2}$ altitude x area of base

# Metric Conversions

## Metric to English

### Area

mm_	x 0.0016	= in_
cm_	x 0.1550	= in_
m_	x 10.765	= ft_

### Energy

N-m	x 0.735	=ft - lb
J	x 0.7375	=ft - lb
MJ	x 0.2778	= kWh

### Flow rate

NI/min x 0.035 = SCFM

### Force

gf	x 2.205 x 10_	= lbf
kgf	x 2.2046	= lbf
N	x 0.2248	= lbf

### Length

um	x 0.0394	= mils
mm	x 0.0394	= in
cm	x 0.3937	= in
m	x 3.2810	= ft

### Power

W	x 0.7376	= ft - lb/s
kW	x 1.341	= hp

### Pressure

kPa	x 0.145	= psi
bar	x 14.50	= psi
kg cm_	x 14.224	= psi
atm	x 14.7	= psi

### Temperature

°F = (1.8 x °C) + 32

### Torque

N - m	x 0.7375	=ft - lb
Kg - m	x 7.2330	=ft - lb

### Volume

mm_	x 6.10 x 10 <sup>5</sup>	=in_
cm_ (cc)	x 0.0610	=in_
m_	x 35.320	=ft_
L	x 0.0353	=ft_

### Weight

g	x 0.0353	=oz
kg	x 2.2046	=lb

## English to Metric

### Area

in_	x 645.16	= mm_
in_	x 6.4516	= cm_
ft_	x 0.0929	= m_

### Energy

ft - lb	x 1.356	= N.m
ft - lb	x 1.356	= J
1 Wh	x 3.6	= MJ

### Flow rate

SCFM x 28.57 = NI/min  
C1.0 = KO.856

### Force

lbf	x 453.6	= gf
lbf	x 0.4536	= kgf
lbf	x 4.4482	= N

### Length

mils	x 2.54	= um
in	x 25.4	= mm
in	x 2.54	= cm
ft	x 0.3048	= m

### Power

ft - lb/s	x 1.356	= W
hp	x 0.7457	= kW

### Pressure

psi	x 6.897	= kPa
psi	x 0.06897	= bar
psi	0.0703	= kg/cm_

### Temperature

°C = 5/9 (F-32)

### Torque

ft - lb	x 1.3559	=N-m
ft - lb	x 0.1383	=kg-m

### Volume

in_	x 16387	= mm_
in_	x 16.387	= cm_ (cc)
ft_	x 0.0283	= m_
ft_	x 28.329	= L

### Weight

oz	x 28.329	= g
lb	x 0.4536	= kg