

# Engineering Formulas and Constants



## Circle

**Area** = Square of Diameter x .7854  
or square of Radius x 3.1416  
**Circumference** = Diameter x 3.1416  
**Diameter** = Circumference x .3183

Doubling diameter increases area four times; tripling diameter increases area nine times, etc.

## Square

**Area** = Square of Side  
**Diagonal** = Side x 1.4142  
**Side** = Diagonal x .7071

## Square Inscribed in Circle

**Side of Square** = Diameter of Circle x .7071  
or Circumference of Circle x .2251  
**Diameter of Circle** = Side of Square x 1.4142  
**Circumference of Circle** = Side of Square x 4.4429

## Square and Circle with Equal Area

**Side of Square** = Diameter of Circle x .8862  
**Diameter of Circle** = Side of Square x 1.128  
**Circumference of Circle** = Side of Square x 3.545

## Rectangle

**Area** = Length x Width  
**Diagonal** = Square root of sum of squares of Width and Length

## Triangle

**Area** = Base x ½ of Perpendicular Height

## Sphere

**Area of Surface** = Square of Diameter x 3.1416  
**Volume** = Cube of Diameter x .5236

## Cube

**Area of Surface** = Square of Side x 6  
**Volume** = Cube of Side  
**Diagonal** = Side x 1.732

## Cylinder

**Area of Curved Surface** = Diameter x Length x 3.1416  
**Volume** = Square of Diameter x Length x .7854

## Cone

**Area of Curved Surface** = Diameter of Base x Slant Height x 1.5708  
**Volume** = Diameter of Base Squared x Perpendicular Height x .2618 or Area of Base x ⅓ Perpendicular Height

1 HP = 33,000 Foot-pounds of work per minute.  
1 BTU = Heat required to raise 1 pound of water °F.  
1 Kilowatt Hour = 3415 BTU  
1 Radian = 57.296 degrees.  
1 Register Ton = 100 cubic feet  
1 U.S. Shipping Ton = 40 cubic feet  
1 British Shipping Ton = 42 cubic feet  
1 Cubic Foot/Minute = 471.9474 cubic cm/second  
1 Cubic Foot/Minute = .1246753 gallons (U.S.)/second  
1 Cubic Foot/Second = 2.2222 cubic yards/minute  
1 Gallon (U.S.)/Minute = 8.020834 cubic feet/hour  
1 Gallon (U.S.)/Minute = 3.785412 liter/minute  
1 Liter/Minute = 2.118880 cubic feet/hour  
1 Cubic Metre/Minute = 264.1720 Gallons (U.S.)/Minute  
1 Pound/Gallon (U.S.) = 7.480519 pound/cubic feet  
1 Mile/Hour = 88 feet/minute  
1 Foot/Minute = .01136364 miles/hour

1 Pound per Square Inch Pressure (PSI) = 144 pounds/square foot = 2.3095 feet fresh water at 62°F = 2.0355 inches mercury at 32°F = 2.0416 inches mercury at 62°F = .068 atmospheres.  
Water Pressure (pounds per square inch) = .433 x height of water in feet (Fresh water at 62°F).  
Weight of 1 cubic foot of fresh water = 62.355 pounds at 62°F = 59.76 pounds at 212°F.  
Weight of 1 gallon (U.S.) water = 8.34 pounds  
Weight of 1 cubic foot of Air at 14.7 lbs per square inch Pressure = .07608 pounds at 62°F = .08703 pounds at 32°F.  
Watts = Amperes x Volts  
1 Watt-Hour = 3.41214 BTU = 859.845 Calorie = 3600 Joule.  
g = Acceleration due to gravity at Sea Level, Latitude 45° = 32.1726 Feet/Second squared.  
1 pound-foot (torque) = 1.355818 Newton-Metre.