

Handy Engineering Formulas for Home Repair

To find circumference of a circle, multiply diameter by 3.1416.

To find diameter of circle, multiply circumference by .31831.

To find area of a circle, multiply square of diameter by .7854.

To find surface of a ball multiply square of diameter by 3.1416.

Area of a rectangle = length multiplied by breadth. Doubling the diameter of a circle increases its area four times.

To find area of a triangle, multiply base by 1/2 perpendicular height.

Area of ellipse = product of both diameters x .7854.

Area of parallelogram = base x altitude.

To find side of an inscribed square, multiply diameter by 0.7071 or multiply circumference by 0.2251 or divide circumference by 4.4428.

Side of inscribed cube = radius of sphere x 1.1547.

To find side of an equal square, multiply diameter by .8862.

Square. A side multiplied by 1.4142 equals diameter of its circumscribing circle. A side multiplied by 4.443 equals circumference of its circumscribing circle. A side multiplied by 1.128 equals diameter of an equal circle. A side multiplied by 3.547 equals circumference of an equal circle.

To find cubic inches in a ball, multiply cube of diameter by .5236.

To find cubic contents of a cone, multiply area of base by 1/3 the altitude.

Surface of frustrum of cone or pyramid - sum of circumference of both ends x 1/2 slant height plus area of both ends.

Contents of frustrum of cone or pyramid = multiply area of two ends and get square root. Add the 2 areas and x 1/3 altitude.

Doubling the diameter of a pipe increases its capacity four times.

A gallon of water (U.S. standard) weighs 8 1/3lbs. and contains 231 cubic inches. A cubic foot of water contains 7 1/2 gallons, 1728 cubic inches, and weight 62 1/2lbs. To find the pressure in pounds per square inch of a column of water, multiply the height of the column in feet by .434.



Steam rising from water at its boiling point (212 degrees F) has a pressure equal to the atmosphere (14.7 pounds to the square inch).

A horse power is equivalent to raising 33,000 lbs. one foot per minute or 550 lbs. one foot per second.

A standard horse power: the evaporation of 30 pounds of water per hour from a feed water temperature of 100 degree F into steam at 70 pounds gauge pressure.

To find capacity of tanks any size, given dimensions of a cylinder in inches, to find its capacity in U.S. gallons: square the diameter, multiply by the length and by .0034.

To ascertain heating surface in tubular boilers, multiply 2/3 the circumference of boiler by length of boiler in inches and add to it the area of all the tubes.

Temperature Conversion

1.8 x Centigrade + 32 degrees = Fahrenheit.

Fahrenheit - 32 degrees x .5566 = Centigrade.

Flooring and Siding

In estimating matched flooring, a square foot of 7/8" inch stuff is considered to be 1-foot board measure. If the flooring is 3" inches or more in width, add 1/4" to assumed board measure to allow for the forming of tongue and groove; for less than 3" inches in width, add 1/3".

A square foot of 1 1/8 inch finished flooring is considered to be 1 1/4 feet board measure. To calculate the board measure of same, figure as if 1" inch thick and add 60 percent to cover extra thickness and waste in tonguing, grooving, etc. Siding is measured by superficial foot. 6" inch siding nominal width actually measures 5 5/8 inches.

Brickwork

Brickwork is estimated by the thousand, and of various thicknesses of wall, runs as follows:

8" 1/4 inch wall, or 1 brick in thickness, 14 bricks per superficial foot
12" 3/4 inch wall, or 1 1/2 brick in thickness, 21 bricks per superficial foot
17" inch wall, or 2 brick in thickness, 28 bricks per superficial foot
21" 1/2 inch wall, or 2 1/2 brick in thickness, 35 bricks per superficial foot

Typical Brick Size

An ordinary brick measures about 8" 1/4 x 4" X 2" inches.

27.343 grains = 1 drachm.

The average weight is 4 1/2 pounds.