

WEIGHTS & MEASURES

LINEAR MEASURE (IMPERIAL)

- 1 Inch (72 Points or 12 Lines or 3 Barleycorns)
- 1 Foot (12 Inches)
- 1 Cubit [forearm] (18 - 22 Inches)
- 1 Yard (3 Feet)
- 1 Fathom (6 Feet)
- 1 Chain [nautical use only] (15 Feet)
- 1 Cable (100 Fathoms)
- 1 Pole [sometimes Rod or Perch] (5.5 Yards)
- 1 Chain [Gunter's] (4 Poles or 22 Yards)
- 1 Furlong ['furrow-long'] (10 Chains or 220 Yards)
- 1 Statute Mile (8 Furlongs or 1760 Yards)
- 1 Nautical Mile [one minute or (1.1515 Statute Miles) sixtieth part of one degree of the Great Circle of the Earth, fixed by the British Admiralty at 6080 Feet]
- 1 League (3 Nautical Miles, sometimes 3 Statute Miles)

SQUARE MEASURE (IMPERIAL)

- 1 Perch (1 Square Pole or 30.25 Square Yards)
- 1 Rood (40 Perches or 1210 Square Yards)
- 1 Acre - the standard amount of land one man could plough in a day with one horse. [1 Chain x 1 Furlong or 10 Square Chains or 4 Roods or 4840 sq yds].
- 1 Square Mile (640 Acres)

OLD SCOTTISH MEASURE

- 1 Ell (37.0598 Imperial inches)
- 1 Fall (6 Ells)
- 1 Scottish Chain (4 Falls or 74.1196 Imperial Feet)
- 1 Scottish Furlong (10 Scottish Chains)
- 1 Scottish Mile (8 Scottish Furlongs or 1976.5 Imperial Yards or 1.123 Statute Miles)
- 1 Scottish Acre (40 Square Falls or 1.261 Imperial Acres)

THE METRIC SYSTEM

Based on the Metre (39.3709 Imperial Inches), which is a ten-millionth part of one quarter of the distance round the world following a meridian (i.e. via both poles).

- 1 Square Decimetre (100 Square Centimetres)
- 1 Square Metre ['Centiare'] (100 Square Decimetres or 10,000 Square Centimetres)
- 1 Are (100 Square Metres)
- 1 Hectare (100 Ares or 10,000 Square Metres)

CAPACITY

- 1 Fluid Drachm (60 Minims)
- 1 Fluid Ounce (8 Fluid Drachms)
- 1 Gill (5 Fluid Ounces)
- 1 Pint (4 Gills)
- 1 Quart (2 Pints)
- 1 Gallon [volume of 10lbs water] (4 Quarts)
- 1 Peck (2 Gallons)
- 1 Bushel (8 Gallons)
- 1 Quarter (8 Bushels)
- 1 Chaldron (4 Quarters)
- 1 Last (10 Quarters)
- 1 Hectolitre is 100 Litres (2.7498 Bushels)

WEIGHT

- 1 Grain [one dry wheat grain] (0.0648 Gram)
- 1 Apothecaries' Scruple (20 Grains)
- 1 Troy Pennyweight (24 Grains)
- 1 Apothecaries' Drachm (3 Scruples or 60 Grains)
- 1 Ounce [Troy or Apothecaries'] (480 Grains or 20 Troy Pennyweight or 8 Apothecaries' Drachms, about 1.1 Imperial Ounces)
- Imperial (Avoirdupois) Weights 1 Dram (27.34 Grains)
- 1 Ounce (16 Drams)
- 1 Pound (16 Ounces)
- 1 Stone (14 Pounds)
- 1 Quarter (28 Pounds)
- 1 Quintal [or Cental] (100 Pounds)
- 1 Hundredweight (112 Pounds or 8 Stone)
- 1 Ton (20 Hundredweight)
- 1 Cubic Centimetre of water weighs 1 Gram
- 1 Cubic Decimetre [1 Litre] of water weighs 1 Kilogram
- 1 Cubic Metre ['Stare'] of water weighs 1 Tonne

TIMBER

- 1 Hoppus Foot (about 1 Cubic Foot in the round, under bark; the industry counts about 28 to 1 Cubic Metre)
- 1 Cord [firewood] (a stack 4 Feet high, 4 Feet across and 8 Feet long, weighing 1.5 Tons fresh or 1 Ton dry)
- 1 Faggot [branchwood] (a tied bundle 2 Feet in girth and 4'6" long)
- 1 Cubic Metre of fresh felled timber weighs a little less than 1 Tonne. By comparison 1 Tonne of harvested wheat occupies 1.35 Cubic Metres, silage 1.3 – 1.4; potatoes 1.55; and a Tonne of dug soil or stone occupies less than half a Cubic Metre.

TO CONVERT MULTIPLY BY

- Feet to Metres 0.3048
- Metres to Feet 3.281

- Miles to Kilometres 1.609
- Kilometres to Miles 0.6214
- Square Feet to Square Metres 0.0929
- Square Metres to Square Feet 10.764
- Square Miles to Square Kilometres 2.59
- Square Kilometres to Square Miles 0.3861
- Acres to Hectares 0.4047
- Hectares to Acres 2.471
- Gallons to Litres 4.546
- Litres to Gallons 0.22
- Cubic Feet to Cubic Metres 0.0283
- Cubic Metres to Cubic Feet 35.31
- Pounds to Kilograms 0.4536
- Kilograms to Pounds 2.205
- Tons to Tonnes 1.016
- Tonnes to Tons 0.9842
- Degrees Fahrenheit to Centigrade deduct 32 and multiply by 0.5555
- Degrees Centigrade to Fahrenheit multiply by 1.8 and add 32

MENSURATION

To set out a right-angle:

- Use the 3-4-5 rule. Construct a triangle that has a perpendicular 3 units in length, a base-line of 4 units and a hypotenuse of 5 units; the angle between the perpendicular and the base is 90 degrees.
- Alternatively, from the point at which the right-angle is required, measure an equal distance either way along the line to be bisected; then increase the length of your measure (1.5 times the original distance is suitable) and, on the side of the base-line where a perpendicular is required, describe an arc from each of the 2 equidistant points. The point where the arcs cross is at 90 degrees from the starting point.

To find the area:

- of a rectangle (or square) multiply the length by the breadth;
- of a parallelogram multiply the base by the perpendicular height;
- of a rhombus multiply the base by the average of the 2 sides;
- of a triangle (the basic shape in land surveying) multiply half the base by the perpendicular height; alternatively, let 'S' be half of the sum of the lengths of the 3 sides, the area is the square root of $S \times (S - \text{side 1}) \times (S - \text{side 2}) \times (S - \text{side 3})$.

Circles:

- To find the **area** multiply the diameter squared by 0.7854, or
- the radius squared by pi (about 3.1416), or
- the circumference squared by 0.0796, or
- the circumference by either one quarter of the diameter or half the radius, or
- the radius by the diameter by 1.57.
- To find the **circumference** multiply the diameter by pi (about 3.1416), or the square root of the area by 3.54.

- To find the **diameter** multiply the circumference by 0.3183, or the square root of the area by 1.1283.
- To find the **radius** multiply the circumference by 0.1591, or the square root of the area by 0.564, or halve the diameter.

The **area of an ellipse** is the major diameter multiplied by the minor diameter multiplied by 0.7854.

The **surface area of a cylinder** is the length multiplied by the circumference plus the areas of both ends; its **volume** is the area of one end multiplied by the length.

The **surface area of a sphere** is the diameter squared multiplied by 0.5236; its **volume** is the diameter cubed multiplied by 0.5236.

The **surface area of a cone** is the area of the base, plus the circumference, multiplied by half the perpendicular height; its **volume** is the area of the base multiplied by one-third the height.

The **volume of a pyramid** is found in the same way as a cone; the **volume of a wedge** is the area of the base multiplied by half the perpendicular height.