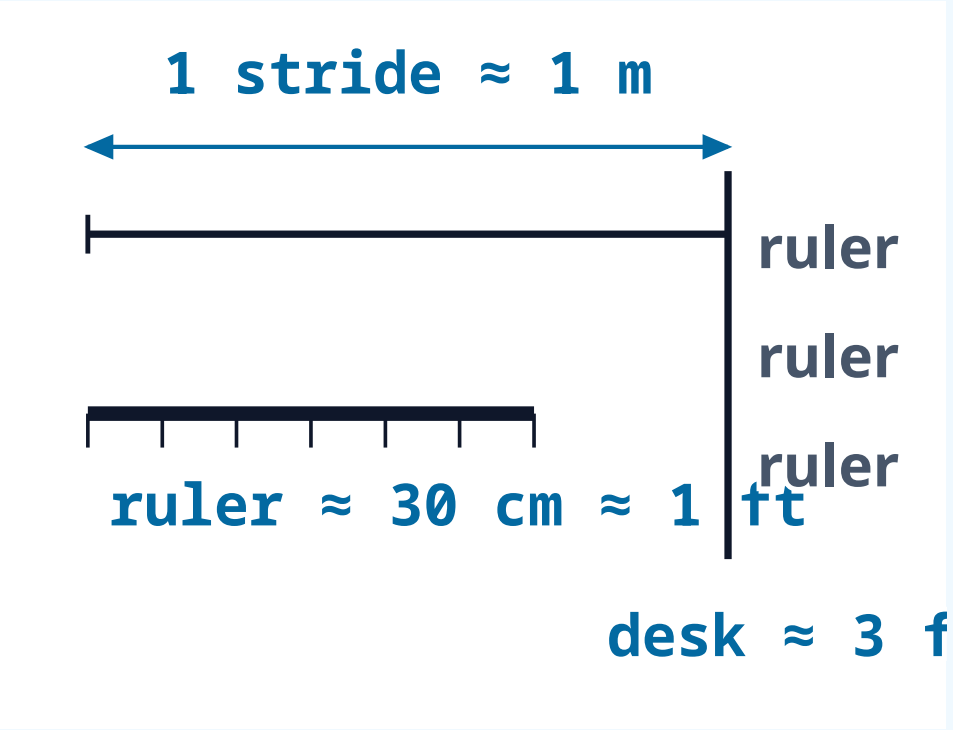
Mathematics 10-3

Unit M: Measurement in SI and imperial

Linear measurement on the job

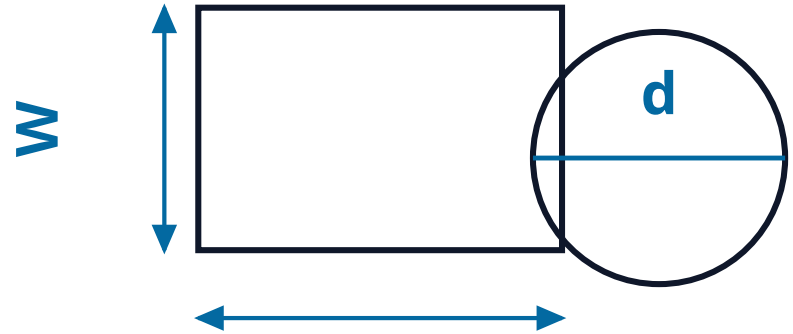
Measuring tools and referents

- A long stride is about 1 metre.
- A ruler is about 30 centimetres, which is also about 1 foot.
- A desk about three rulers tall is about three feet.
- A pipe fitter reads an outside diameter and an inside diameter before ordering a sleeve that has to match the wall.



Referents and perimeter formulas

- OD means outside diameter.
- ID means inside diameter.
- The pipe wall is half of OD minus ID.
- Perimeter walks the outline: P = 2(L + W).
- L is length and W is width.
- Around a circle, C = 3.14 times the diameter.
- C is circumference and 3.14 stands in for pi.
- A shipping size adds length, width, and height.
- The midpoint is half the board.
- Put the measured number in place of each letter.



Key terms

outside diameter

The distance across a pipe or tube measured on the outer surface. (OD)

inside diameter

The distance across the opening inside a pipe or tube. (ID)

perimeter

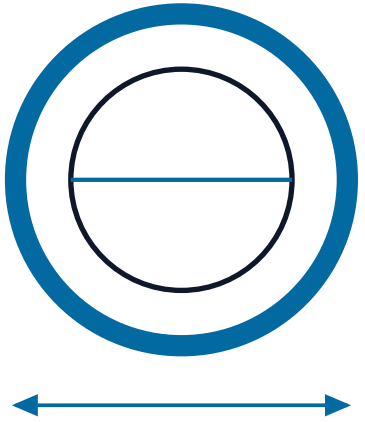
The distance around a flat shape. For a rectangle, P = 2(L + W). (P)

circumference

The distance around a circle. In this course C = pi d with pi taken as 3.14. (C)

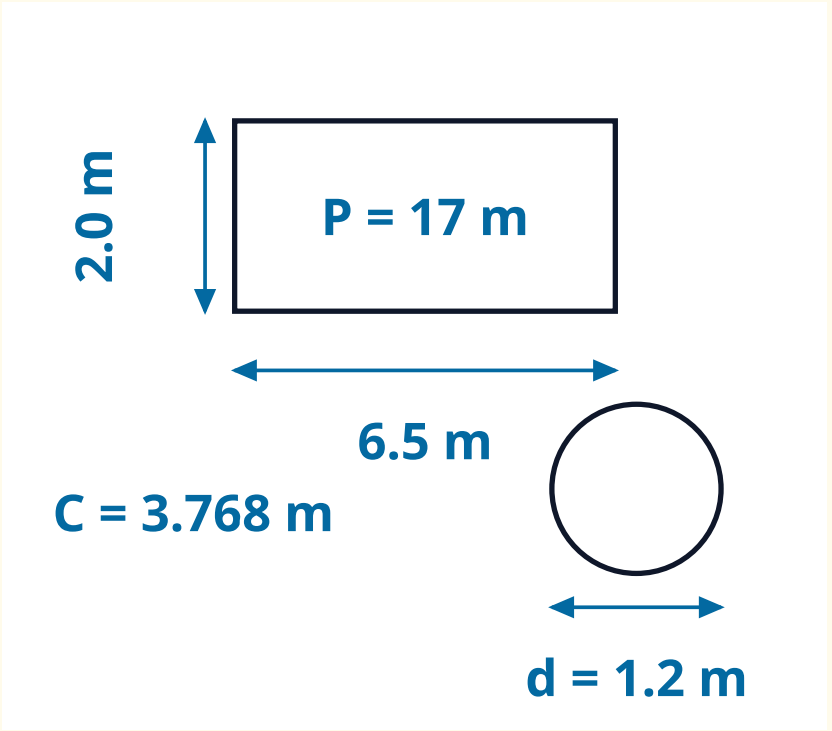
Half the diameter gap

- Outside 5.2 centimetres minus inside 4.6 centimetres equals a gap of 0.6 centimetres.
- Half of 0.6 is 0.3, so the wall thickness is 0.3 centimetres.
- Outside 26 millimetres minus inside 20 millimetres equals a gap of 6 millimetres.
- Half of 6 millimetres is a 3 millimetre wall.



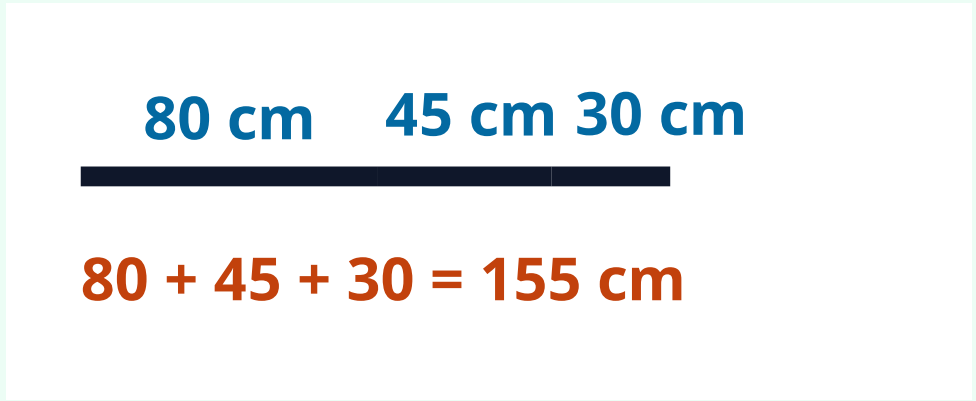
A mat outline and a round lid

- A mat 6.5 metres by 2.0 metres has P = 2(L + W).
- Add 6.5 plus 2.0 to get 8.5, then times 2 to get 17 metres.
- The letter C stands for circumference, d for diameter, and pi is 3.14.
- A diameter of 1.2 metres gives C = 3.14 times 1.2.
- Multiplying 3.14 by 1 equals 3.14 and 3.14 times 0.2 equals 0.628, so the circumference is 3.768 metres.
- A diameter of 0.5 metres gives 3.14 times 0.5 equals 1.57 metres.



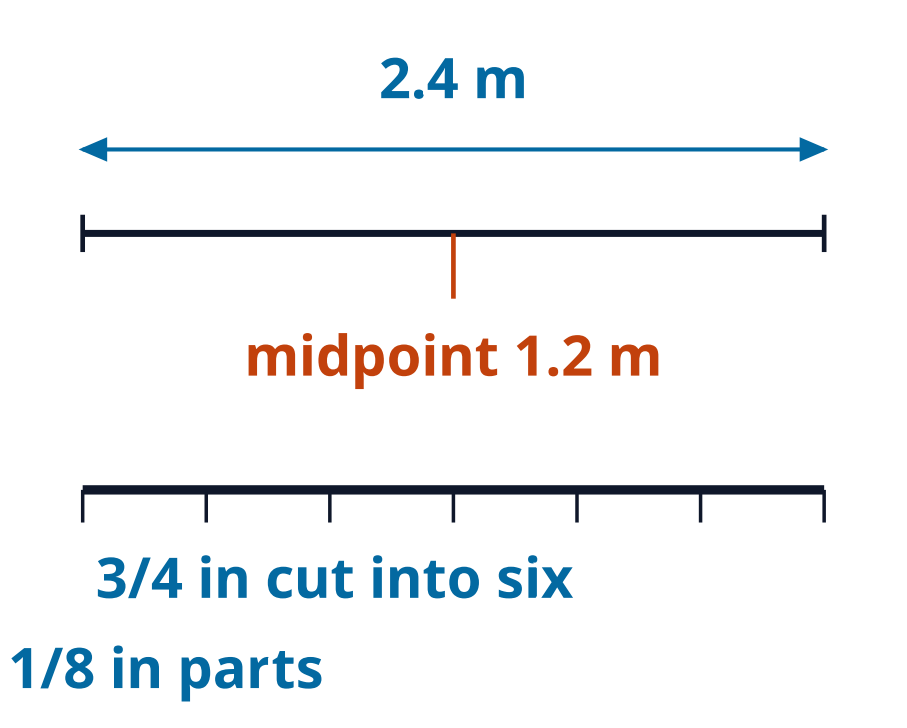
Shipping linear size

- The letters L, W, and H stand for length, width, and height in the shipping sum L + W + H.
- A carton of 80 centimetres, 45 centimetres, and 30 centimetres adds to 155 centimetres.
- A suitcase of 70, 40, and 25 centimetres adds to 135 centimetres, and 135 sits below a stated limit of 158 centimetres.



Midpoints and segments

- A midpoint is half the length.
- A 2.4 metre board marks at 1.2 metres, and a 94 inch board marks at 47 inches.
- Dividing 3/4 by 1/8 equals 6, because 3/4 times 8/1 equals 6, so a 3/4 inch strip yields six 1/8 inch segments.
- Adding joins lengths, multiplying counts repeated equal pieces, and dividing by 2 marks a midpoint.
- Compare the result with a referent.



Job-site linear check

- Find the wall for an outside diameter of 26 millimetres and an inside diameter of 20 millimetres.
- Find the perimeter of a 6.5 metre by 2.0 metre mat and say why the result is reasonable.

