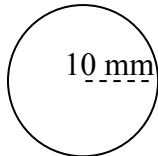# Measurement Quick Reference Sheet

All calculations must be done with the same units. Any change of units must be done first.

Perimeter

In simple cases the perimeter is given by adding all the distances given.

The perimeter of a circle is found by **circumference = π × diameter**. Do not use the radius!

Radius = 10 mm, so the diameter = 2 × 10 = 20 mm

Circumference = π × 20 = 62.8 mm

When finding perimeters with a part of a circle the circumference of the full circle is calculated, then multiplied by the fraction involved. Do not forget to add the straight line parts too.
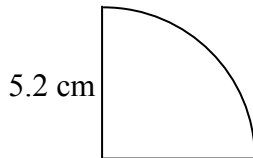
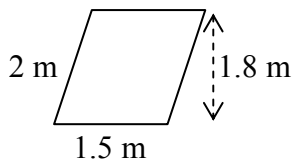The height given is the radius, so diameter = 5.2 × 2 = 10.4 cm

Curved line is quarter of full circle = ¼ × π × 10.4 = 8.17 cm

Perimeter = curve + line + line = 8.17 + 5.2 + 5.2 = 18.57 cm

Area

The area of a rectangle or parallelogram = base × height.

Height is always at 90° to the base. Do not use both side lengths for finding areas of parallelograms.

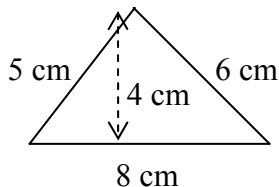Area = base × height = 1.5 × 1.8 = 2.7 m^2

(the 2 m side length is used for perimeter, but is not a height)

The area of a triangle = ½ × base × height or = base × height ÷ 2. Do not forget the half!
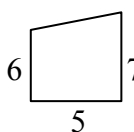
The base is any side and height is at right angles to that base (and that means it might not be a side).

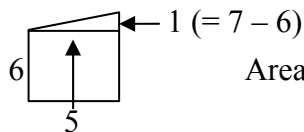Area = ½ × base × height = ½ × 8 × 4 = 16 cm^2

(neither the 5 nor 6 are a height for the base of 8)

Any trapezium can be broken into a rectangle and triangles.

1 (= 7 – 6)
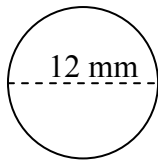
Area = (6 × 5) + (½ × 5 × 1) = 32.5 units^2

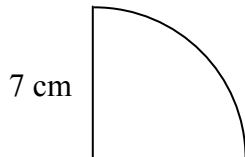The **area of a circle = π × r^2**, where the r is the radius. Do not use the diameter!

If the diameter is given it must be halved to find the radius first, before anything else is calculated.

Diameter = 12 mm, so the radius = 12 ÷ 2 = 6 mm
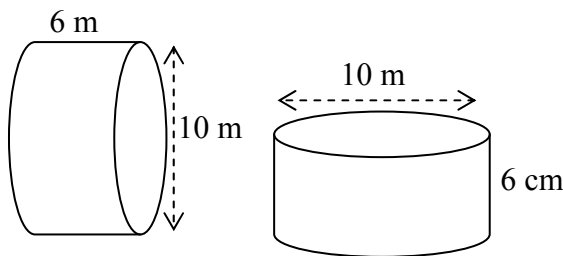
Area = π × radius^2 = π × 6^2 = 113.1 mm^2

When working out areas with a slice of a circle, the area of the full circle is calculated, then multiplied by the fraction involved.

Area = ¼ of a circle = ¼ × π × 7^2 = 38.5 cm^2

Volume

For a prism **volume = base area × depth**, where depth at 90° to the base.

Volume = base area × depth

= π × r^2 × depth

= π × 5^2 × 6 = 471.2 cm^3

for both cylinders

If all the edges are at 90°, the object is a cuboid, and the volume = base × height × depth.
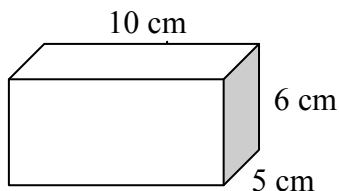
Volume = base area × depth = (5 × 6) × 10 = 300 cm^3

Surface Area

Surface area is found by adding up the area of all the surfaces of the object (which will include those hidden from view). It often helps to draw a "net" of the object when calculating surface area.

Units

All answers **must** have units. Change all units to the same type at the **start** of any calculation.

Perimeter = cm, m etc.

Area and surface area = cm^2, m^2 etc and hectares.

Volume = cm^3, m^3 etc and litres.

100 cm = 1 m, 1,000 m = 1 km, 1,000 mm = 1 m

100 ha = 1 km^2 or 1 ha = 100 m × 100 m

1 L = 1000 cm^3 or 1000 L = 1 m^3