Planner

Prisms

- Finding the volume and surface area of a prism
- Finding the volume and surface area of a cylinder
- Solving problems involving prisms

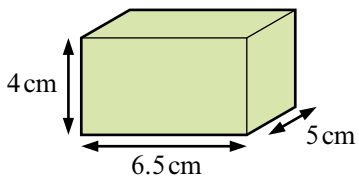
Keywords

You should know

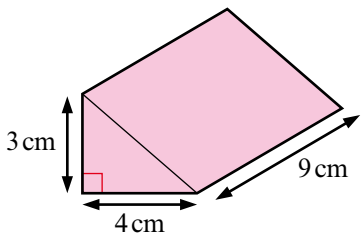
explanation 1a | explanation 1b | explanation 1c | online

1 Work out the volume of each of these prisms.

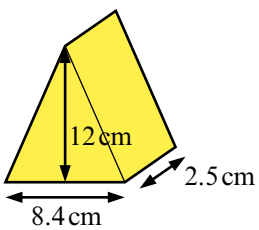
a



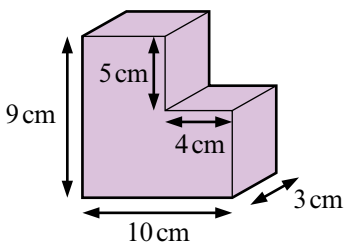
b



c



d

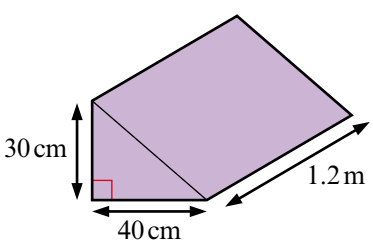


2 Work out the volume of each prism.

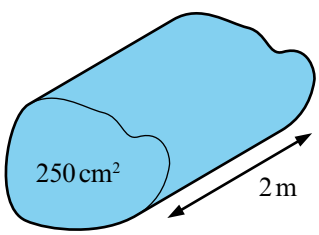
i Give your answer in cubic centimetres.

ii Give your answer in cubic metres.

a



b

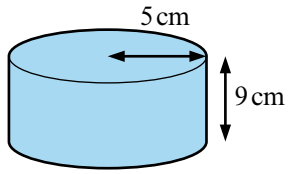


explanation 2a | explanation 2b

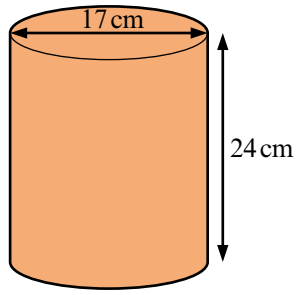
3 Work out the volume of each of these cylinders.

Give your answers correct to three significant figures.

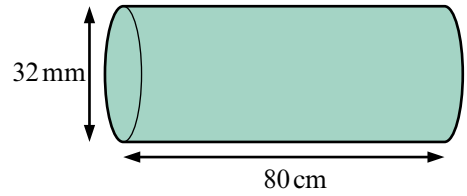
a



b



c



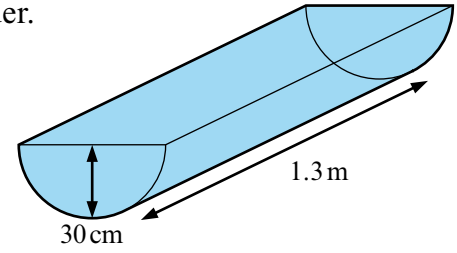
4 A water pipe is in the shape of a cylinder. It has a length of 3 m and a radius of 28 cm. Work out the volume of the pipe.

a Give your answer correct to 3 s.f. in cm^3.

b Give your answer correct to 3 s.f. in m^3.

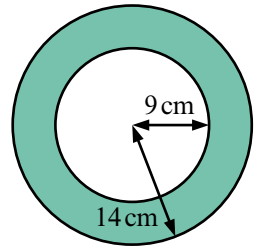
5 A water trough is in the shape of half a cylinder.

Work out the volume of the water trough.
Give your answer correct to 3 s.f.



6 A pipe of length 5.6 m is made of concrete.
The diagram shows the cross-section of the pipe.

It has an inner radius of 9 cm and an outer radius of 14 cm.



a Work out the volume of concrete in the pipe.

i Give your answer correct to 3 s.f. in cubic centimetres.

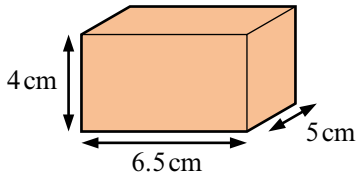
ii Give your answer correct to 3 s.f. in cubic metres.

b Concrete has a density of 2400 kg/m^3. Work out the mass of the pipe.

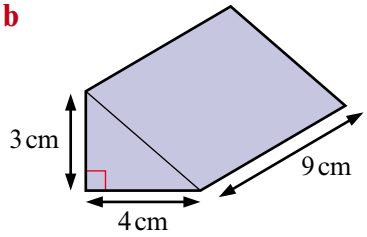
explanation 3

7 Find the surface area of each of these prisms.

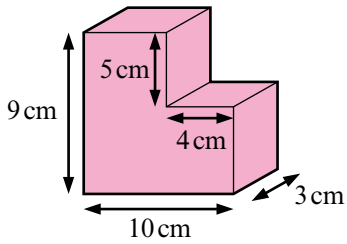
a



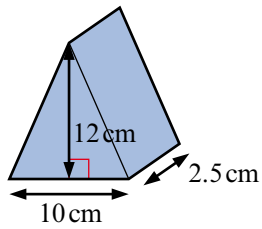
b



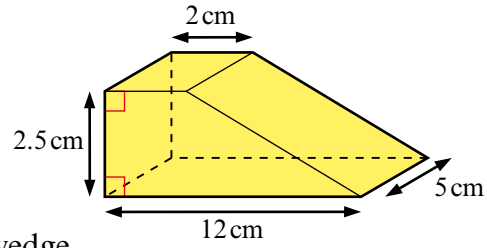
c



d



8 A door wedge is in the shape of a prism with a cross-section in the shape of a trapezium as shown.



a Work out the volume of wood used in the door wedge.

b Work out the surface area of the door wedge.

c Martin makes some of these door wedges to sell.

He decided to paint all the surfaces with specialist paint.

The paint costs £1.45 for a tin that covers $0.2\,m^2$.

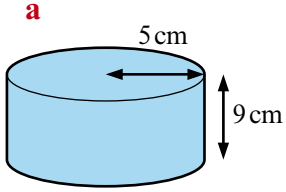
Martin makes 60 door wedges.

Work out how much he will need to spend on paint if he paints all the door wedges.

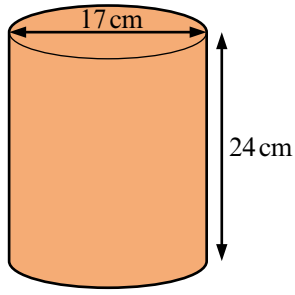
explanation 4a | explanation 4b | online

9 Find the total surface area of each solid cylinder. Give your answers correct to three significant figures.

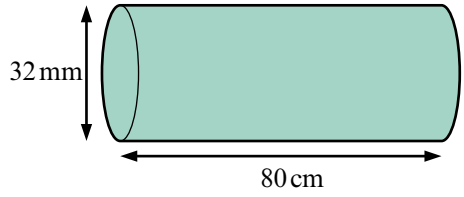
a



b



c



10 Find the total surface area of each solid cylinder. Give your answers correct to three significant figures.

a height = 28 cm, diameter = 30 cm

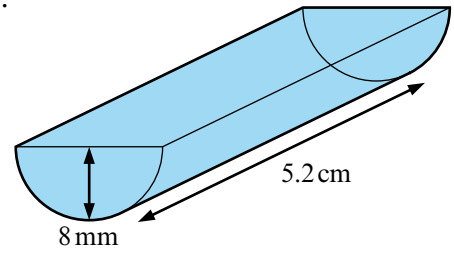
b length = 4 m, radius = 3 cm

c length = 35 cm, diameter = 3 cm

11 A bucket with no lid is in the shape of a cylinder. The height of the bucket is 45 cm. It has a diameter of 34 cm. Work out the surface area of the bucket, including the inner surface. Give your answer correct to three significant figures.

12 A tin of food has a height of 5.8 cm and a diameter of 7.4 cm. The tin has a label wrapped around its curved surface. Work out the area of the label. Give your answer correct to three significant figures.

13 A solid length of moulding is made of wood.
It has a semicircle at both ends.
Work out its total surface area.
Give your answer correct to three significant figures.



explanation 5

14 The volume of a prism is 80 cm^3. The area of its cross-section is 16 cm^2. Work out the length of the prism.

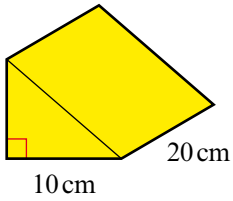
15 The volume of a prism is 12 000 cm^3. Its length is 1.5 m. Find the area of its cross-section.

16 A triangular prism has a volume of 700 cm^3.

The prism has a length of 20 cm.
Its cross-section is a right-angled triangle.

The base of the triangle is 10 cm.

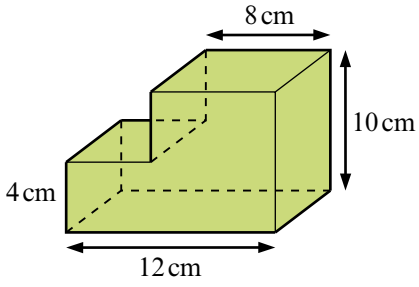
Work out the height of the triangle.



17 The volume of this prism is 1248 cm^3.

a What is the area of the cross-section?

b What is the length of the prism?



18 The volume of a cylinder is 1200 cm^3. The radius of its end is 5.4 cm. Work out the length of the cylinder. Give your answer correct to one decimal place.

19 A piece of pipe is 4.5 m in length. It has a volume of 7480 cm^3. Work out the diameter of the pipe. Give your answer correct to one decimal place.

20 A bucket is in the shape of a cylinder of radius 15 cm and height 37 cm. The bucket is full of water. The water is poured into a trough in the shape of a cuboid 45 cm long, 24 cm wide and 30 cm high. Work out the depth of the water in the trough. Give your answer to the nearest millimetre.

21 The volume of this triangular prism is 594 cm^3.

Work out the surface area of the prism.