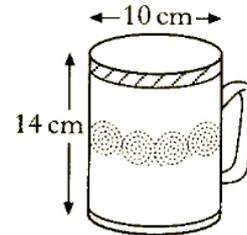# VOLUME PAST PAPER QUESTIONS

1. A cylindrical soft drinks can is 15cm in height and 6·5cm in diameter.
   A new cylindrical can holds the same volume but has a reduced height of 12cm.
   What is the diameter of the new can?
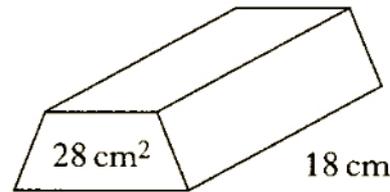   Give your answer to 1 decimal place. **4**

2. A mug is in the shape of a cylinder with diameter
   10cm and height 14cm.
   a) Calculate the volume of the mug.
   b) 600ml of coffee are poured in. **2**
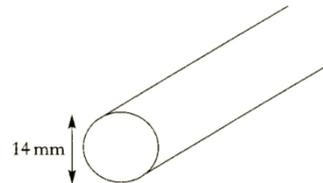   Calculate the depth of the coffee in the cup. **3**

3. a) A block of copper 18cm long is prism
      shaped as shown.
      The area of its cross section is 28cm2.
      Find the volume of the block. **1**
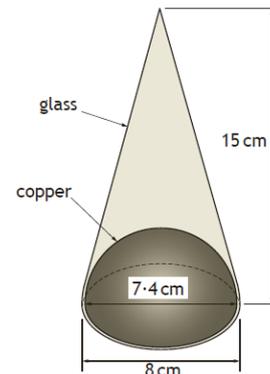
   b) The block is melted down to make a
      cylindrical cable of diameter 14mm.
      Calculate the length of the cable. **4**

4. An ornament is in the shape of a cone with
   diameter 8cm and height 15cm. The bottom
   contains a hemisphere made of copper with
   diameter 7·4cm. The rest is made of glass,
   as shown in the diagram.
   Calculate the volume of the glass part of the
   ornament.
   Give your answer correct to 2 significant figures. **5**
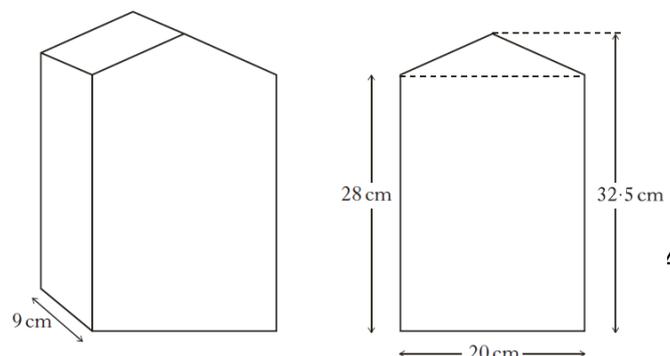
5. a) The Earth is approximately spherical with a radius of 6400 kilometres.
      Calculate the volume of the Earth giving your answer in scientific notation,
      correct to 2 significant figures. **3**
   b) The approximate volume of the Moon is 2·2 × 1010 cubic kilometres.
   Calculate how many times the Earth's volume is greater than the Moon's. **2**

6. A container for oil is in the shape of a prism.
   The width of the container is 9 centimetres.
   The uniform cross section of the container
   consists of a rectangle and a triangle with
   dimensions as shown.
   Calculate the volume of the container,
   **correct to the nearest litre.** **4**

7. A concrete block is in the shape of a prism.

22 cm

60 cm

32 cm

22 cm

20 cm

32 cm
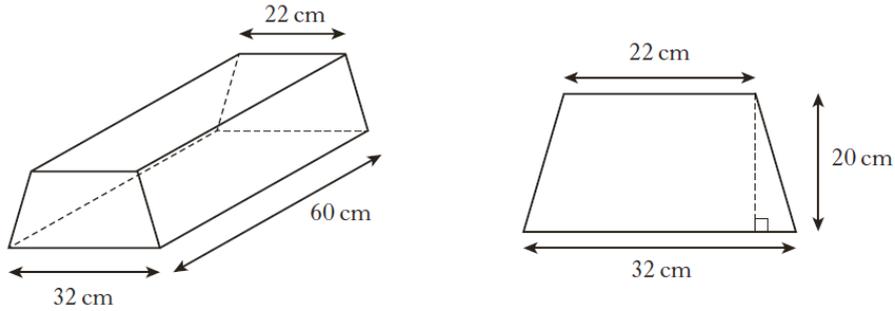
The cross section of the prism is a trapezium with dimensions as shown.
a) Calculate the area of the cross section.
b) Calculate the volume of the concrete block.

8. A flower planter is in the shape of a prism.
The cross-section is a trapezium with dimensions as shown.

68 cm

30 cm 24 cm 30 cm

32 cm
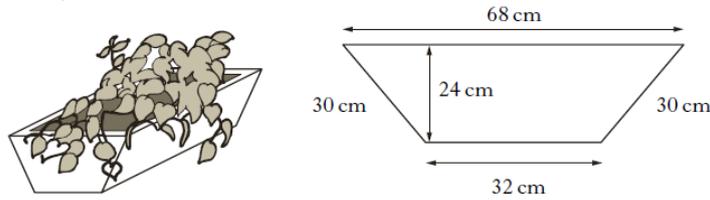
a) Calculate the area of the cross-section of the planter. 2
b) The volume of the planter is 156 litres.
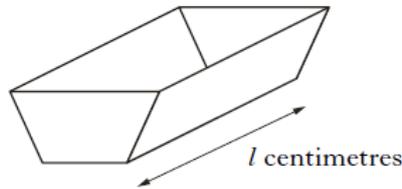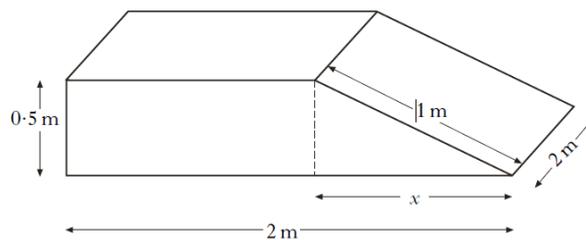
l centimetres

   Calculate the length, *l* centimetres, of the planter. 3

9. A concrete ramp is to be built.
The ramp is in the shape of a cuboid and a triangular prism with dimensions as shown.

0·5 m

1 m

2 m

x

2 m

a) Calculate the value of *x*. 2
*b*) Calculate the volume of concrete required to build the ramp. 3

10. Lemonade is to be poured from a 2 litre bottle into glasses.
Each glass is in the shape of a cylinder of radius 3 cm and height 8 cm.
How many full glasses can be poured from the bottle? 4

2
litres
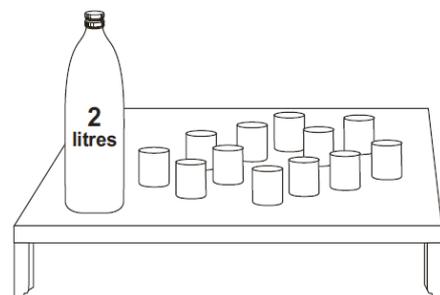
11. *a)* A cylindrical paperweight of radius 3 cm and
height 4 cm is filled with sand.
Calculate the volume of sand in the paperweight. 2

3 cm

4 cm
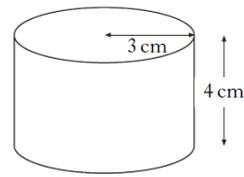
b) Another paperweight, in the shape of a hemisphere,
is filled with sand.
It contains the same volume of sand as the first
paperweight.
Calculate the radius of the hemisphere. 3

r
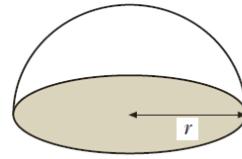
12. A health food shop produces cod liver oil
capsules for its customers.
Each capsule is in the shape of a cylinder
with hemispherical ends as shown in the
diagram below.
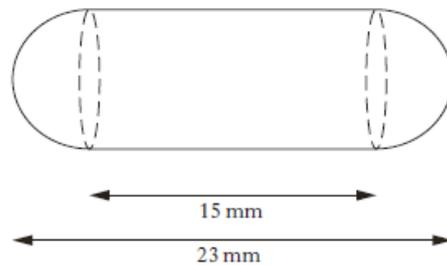
15 mm

23 mm

The total length of the capsule is 23 mm and the length of the cylinder is 15 mm.
Calculate the volume of one cod liver oil capsule. 4

13. The Battle of Largs in 1263 is commemorated
by a monument known as The Pencil.
This monument is in the shape of a cylinder
with a cone on top.
The cylinder part has diameter 3 metres and height 15 metres.
a) Calculate the volume of the **cylinder** part of The Pencil. 2

The volume of the **cone** part of The Pencil is 5·7 cubic metres.
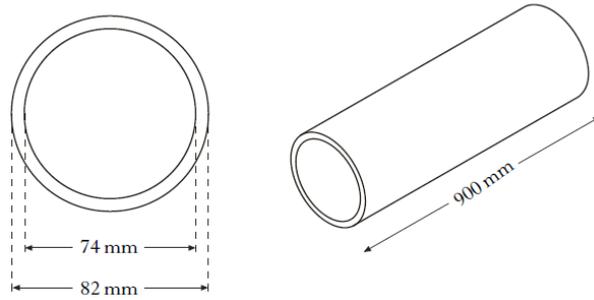*b)* Calculate the **total** height of The Pencil. 3

14. A cylindrical container has a volume of
3260 cubic centimetres.
The radius of the cross section is
6·4 centimetres.
Calculate the height of the cylinder. 3

6·4 cm

15. A company manufactures aluminium tubes.
    The cross-section of one of the tubes is shown in the diagram below.


    The inner diameter is 74 millimetres.
    The outer diameter is 82 millimetres.
    The tube is 900 millimetres long.
    Calculate the volume of aluminium used to make the tube.
    Give your answer correct to three significant figures.   5

16. Jim Reid keeps his washing in a basket. The basket is in the shape of a prism.
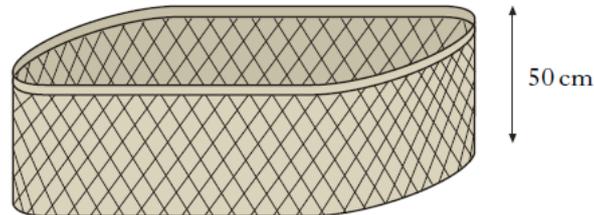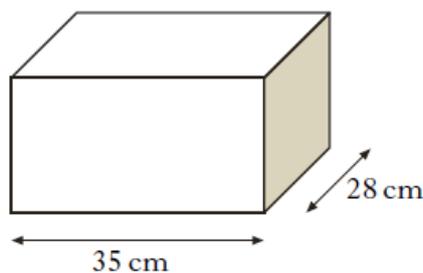

    The height of the basket is 50 centimetres.
    The cross section of the basket consists of a rectangle and two semi-circles with
    measurements as shown.
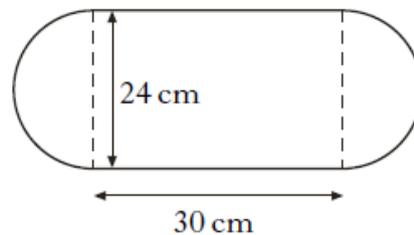
    a) Find the volume of the basket in cubic centimetres.
       Give your answer correct to three significant figures.   4

   Jim keeps his ironing in a storage box which has a volume **half** that of the basket.

    The storage box is in the shape of a cuboid, 35 centimetres long and 28 centimetres broad.
    b) Find the height of the storage box.   3

17. A glass ornament in the shape of a cone is
partly filled with coloured water.
The cone is 24 cm high and has a base of
diameter 30 cm.
The water is 16 cm deep and measures
10 cm across the top.
What is the volume of the water?
Give your answer correct to 2 significant figures.

10 cm

24 cm

16 cm

30 cm
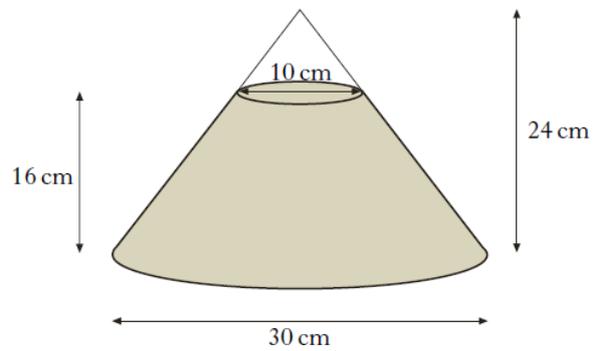
5

18. A child's toy is in the shape of a hemisphere
with a cone on top, as shown in the diagram.
The toy is 10 cm wide and 16 cm high.
Calculate the volume of the toy.
Give your answer correct to 2 significant
figures.

16 cm

10 cm
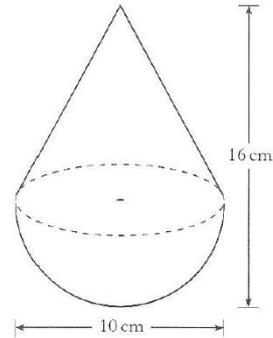
5

19. A pharmaceutical company makes vitamin pills
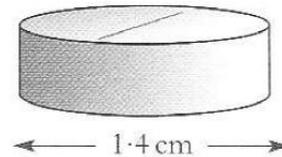in the shape of spheres of radius 0·5cm.

a) Calculate the volume of one pill.
   Give your answer correct to 2 significant figures.

3

The company decides to change the shape of each
pill to a cylinder.

b) The new pill has the same volume as the original
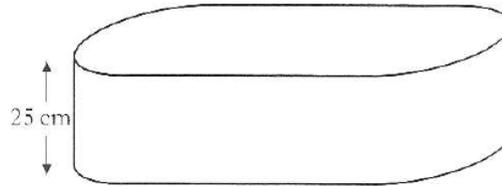   and its diameter is 1·4cm.
   Calculate the height of the new pill.

1·4 cm

3

20. Perfecto Ice Cream is sold in cones and cylindrical tubs with measurements as shown below.

10.4 cm

PERFECTO

20 cm

11 cm

PERFECTO   5.8 cm
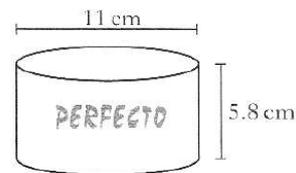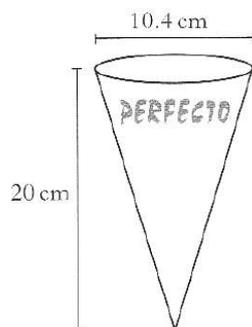
Both the cone and the tub of ice cream cost the same.
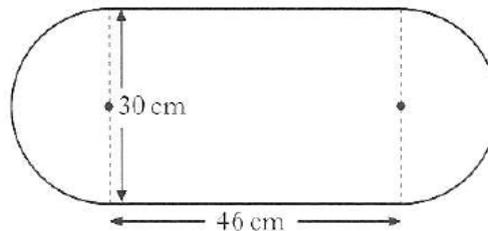Which container of ice cream is the better value for money?

5

21.   A garden trough is in the shape of a prism.
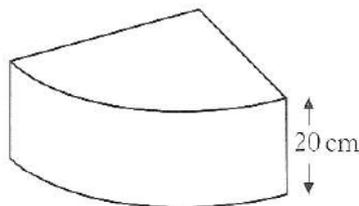
The height of the trough is 25cm.
The cross-section of the trough consists of a rectangle and two semi-circles with measurements as shown.

a) Find the volume of the garden trough in cubic centimetres.
    Give your answer correct to 2 significant figures.   4

A new design of garden trough is planned by the manufacturer.
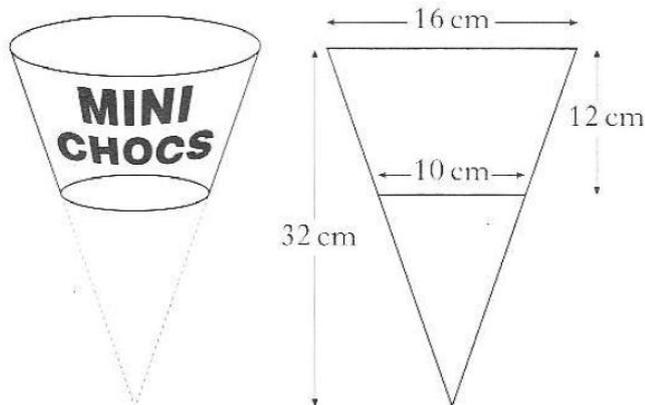
The height of the trough is 20cm.
The uniform cross-section of this trough is a quarter of a circle.
The volume of the trough is 30 000cm^3.
b) Find the radius of the cross-section.   3

22.   A container to hold chocolates is in the shape
       of part of a cone with dimensions as shown
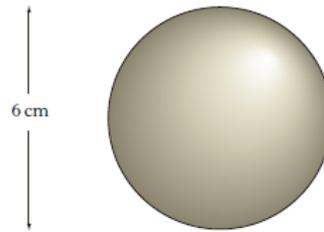   below.

Calculate the volume of the container.
Give your answer correct to 1 significant figure.   5

23. The diagram below represents a sphere.
The sphere has a diameter of 6 centimetres.
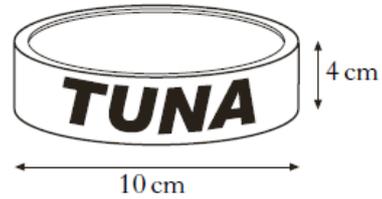Calculate its volume.
Take π = 3·14.

6 cm

2

24. A tin of tuna is in the shape of a cylinder.
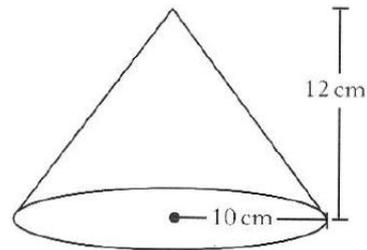It has diameter 10 cm and height 4 cm.
Calculate its volume.
Take π = 3.14.

4 cm

TUNA

10 cm

2

25. The diagram shows a cone,
The height is 12cm and the radius of the
base 10cm.
Calculate the volume of the cone.
Take π = 3.14.

12 cm

10 cm

2