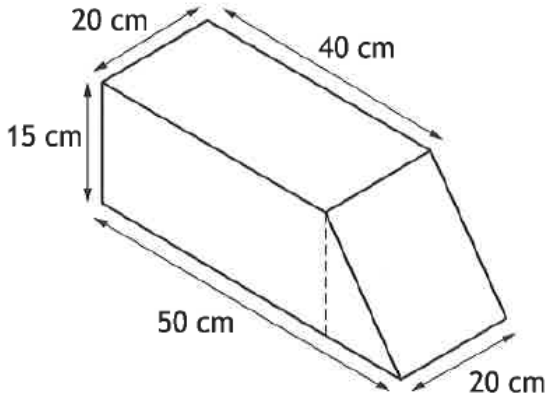
SQA Past paper questions

2024 - Paper 1 - Question 7

A container consists of a cuboid and a triangular prism.

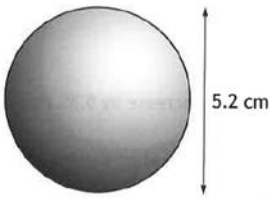


Calculate the volume of the container.
Give your answer in **litres**. 3

Click here for video solution.

2024 - Paper 2 - Question 2

A snooker ball is a sphere with a diameter of 5.2 cm.



(a) Calculate the volume of the snooker ball. 2

The density of an object can be calculated using the formula below.

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

The mass of the snooker ball is 142 grams.

(b) Calculate the density of the snooker ball.
Give your answer in grams per cubic centimetre. 1

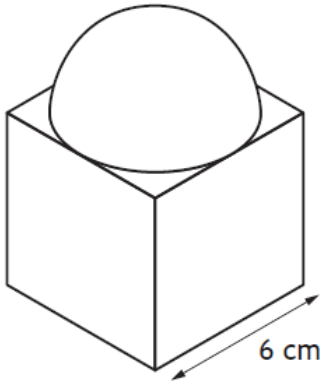
Click here for video solution.

2023 - Paper 2 - Question 6(c)

Lorna also purchased a paperweight as a gift.

The paperweight is made in the shape of a cube with a hemisphere on top.

The hemisphere is half of a sphere with a diameter of 6 cm.



Calculate the volume of the paperweight. 3

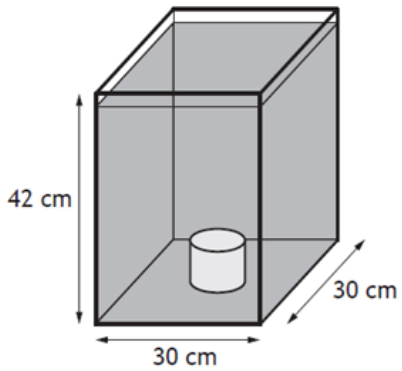
Click here for video solution.

2022 - Paper 2 - Question 7(b)

Jamel has a fish tank.

The fish tank is a cuboid with dimensions 30 cm by 30 cm by 42 cm.

The tank has a cylindrical light box at the bottom as shown.



The cylindrical light box has a diameter of 10 cm and a height of 8 cm.

There is a **2 cm gap** between the top of the tank and the water level.

The light box **does not** hold any water.

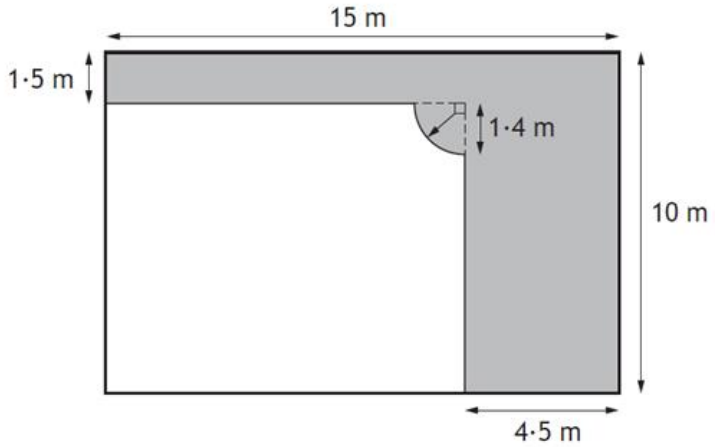
Calculate the volume of water in the tank. 4

Click here for video solution.

2021 - Paper 2 - Question 4(a)

Colin is spreading a layer of bark in part of his garden.

The area of the garden that Colin is covering in bark is shaded in the diagram.



The layer of bark needs to be 50 millimetres deep.

Calculate the volume of bark needed.

Give your answer **in litres.** 5

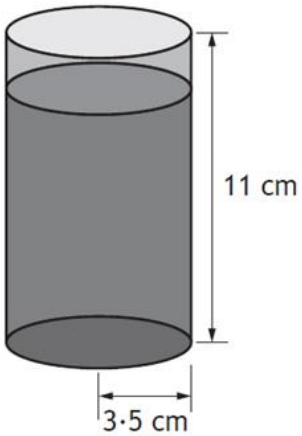
Click here for video solution.

2021 - Paper 2 - Question 7(a)

Dougie is organising a birthday party for his son.

There will be 13 children at the party.

He will give them juice in cups that are cylindrical with dimensions as shown.



- Each cup will be filled with juice to 2 cm from the top.
- He will give each child 2 cups of juice.
- He will buy the juice in bottles which each contain 1·75 litres.

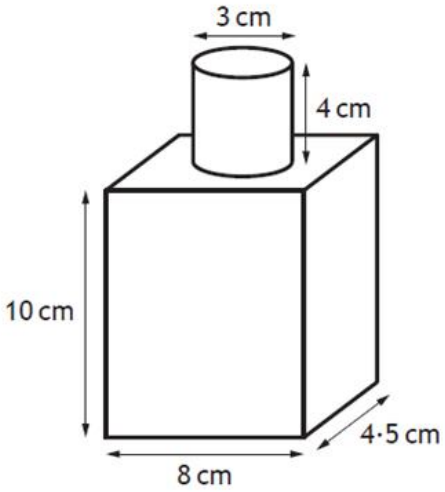
Calculate the number of bottles of juice he will need to buy. 4

Click here for video solution.

2019 - Paper 2 - Question 2

A bottle consists of a cuboid and a cylinder.

The dimensions are shown in the diagram.

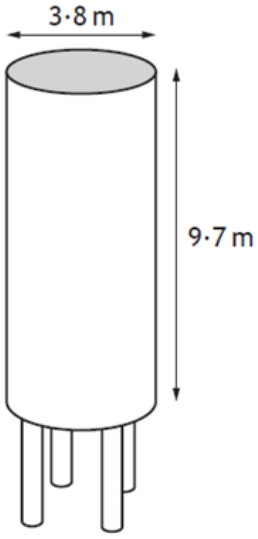


Calculate the volume of the bottle. 4

Click here for video solution.

2018 - Paper 2 - Question 4(b)

The storage container for sheep food is in the shape of a cylinder, with dimensions as shown below.

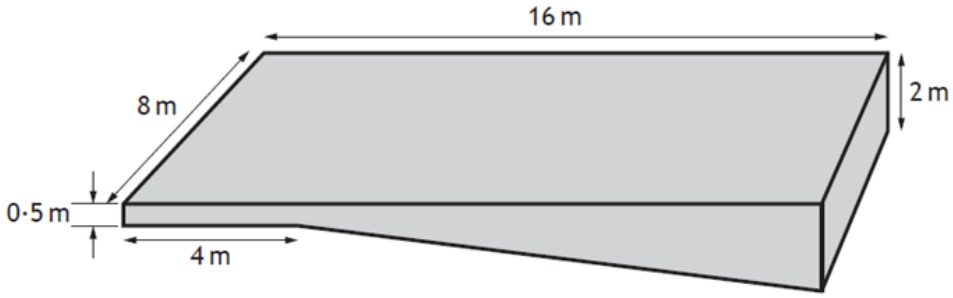


Calculate the volume of the storage container. 2

Click here for video solution.

2018 - Paper 2 - Question 11(c)

A swimming pool is a prism, with dimensions as shown in the diagram below.

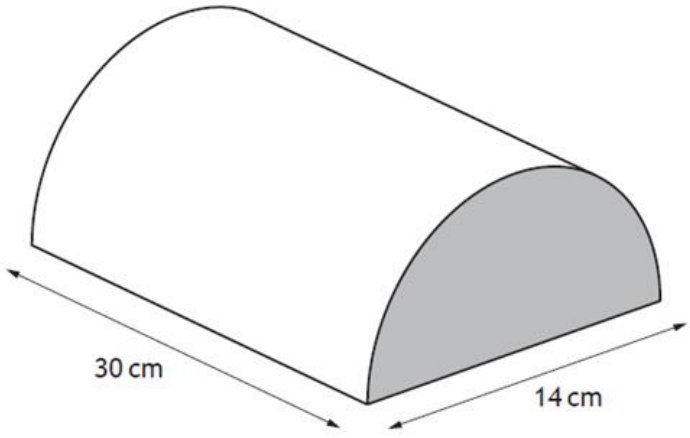


Calculate the volume of the swimming pool.
Give your answer **in litres.** 4

Click here for video solution.

2017 - Paper 2 - Question 1

The Victorians used stoneware hot water bottles.
They were semi-circular prisms as shown.
The diameter of the bottle is 14 cm and the length is 30 cm.



Calculate the volume of the hot water bottle. 3

Click here for video solution.

2016 - Paper 2 - Question 8(c)

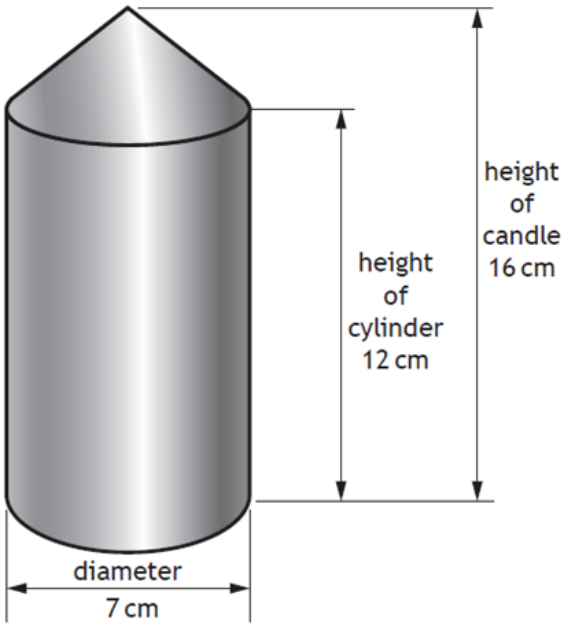
Brendan makes blue candles in the shape of a cylinder with a cone on top as shown.

He buys blue wax in blocks with volume 12 000 cm^3.

Brendan thinks that he can make 25 of these candles from one block of wax.

Is he correct?

Use your working to justify your answer. 7



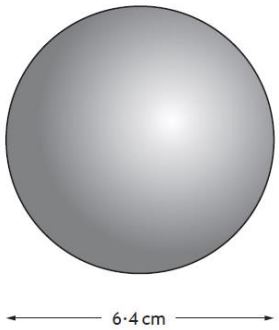
Click here for video solution.

National 5 Maths Extra Practice

1. "Easy paper 2" calculating a volume

2018 - Paper 2 - Question 7

A toy company makes juggling balls in the shape of a sphere with a diameter of 6·4 centimetres.



Calculate the volume of one juggling ball.

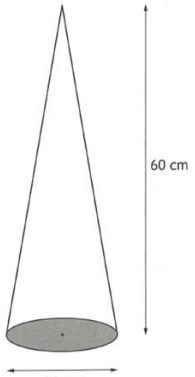
Give your answer correct to 2 significant figures. 3

Click here for video solution.

2. Non-calculator calculating a volume

2022 - Paper 1 - Question 3

The diagram below shows a cone with diameter 20 centimetres and height 60 centimetres.



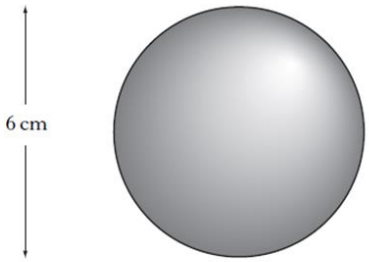
Calculate the volume of the cone.
Take $\pi = 3.14$.

2

Click here for video solution.

2010 - Paper 1 - Question 3

The diagram below represents a sphere.



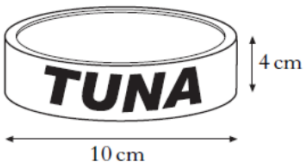
The sphere has a diameter of 6 centimetres.
Calculate its volume.
Take $\pi = 3{\cdot}14$.

2

Click here for video solution.

2007 - Paper 1 - Question 3

A tin of tuna is in the shape of a cylinder.



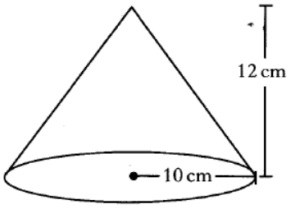
It has diameter 10 centimetres and height 4 centimetres.
Calculate its volume.
Take $\pi = 3{\cdot}14$.

2

Click here for video solution.

2003 - Paper 1 - Question 3

The diagram shows a cone.



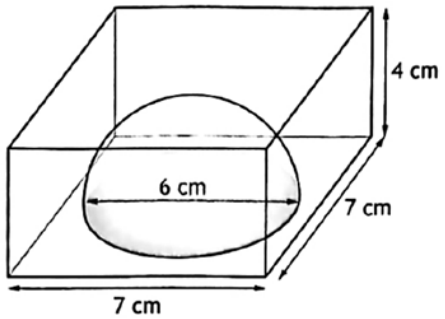
The height is 12 centimetres and the radius of the base 10 centimetres.
Calculate the volume of the cone.
Take $\pi = 3{\cdot}14$. 2

Click here for video solution.

3. Composite volumes

2024 - Paper 2 - Question 7

A paperweight is in the shape of a cuboid.
It consists of a hemisphere of red glass surrounded by clear glass.

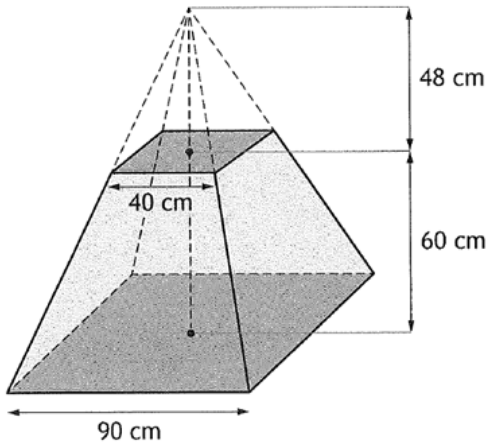


The cuboid has height 4 centimetres and a square base of length 7 centimetres.
The hemisphere has diameter 6 centimetres.
Calculate the volume of clear glass in the paperweight.
Give your answer correct to 2 significant figures. 4

Click here for video solution.

2023 - Paper 2 - Question 9

A concrete block is in the shape of a large pyramid with a small pyramid removed.



The large pyramid has a square base of length 90 centimetres.

The small pyramid has a square base of length 40 centimetres and a height of 48 centimetres.

The block has height 60 centimetres.

Calculate the volume of the block. 4

Click here for video solution.

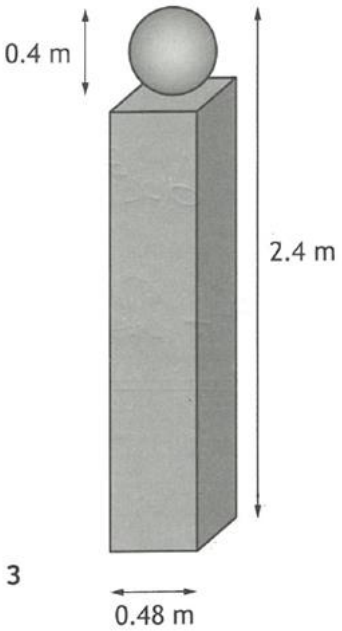
2022 - Paper 2 - Question 3

A concrete gatepost is made in the shape of a cuboid with a sphere on top.

The sphere has diameter 0.4 metres.

The cuboid has a square base of length 0.48 metres.

The total height of the gatepost is 2.4 metres.



Calculate the volume of concrete needed to make a gatepost. 3

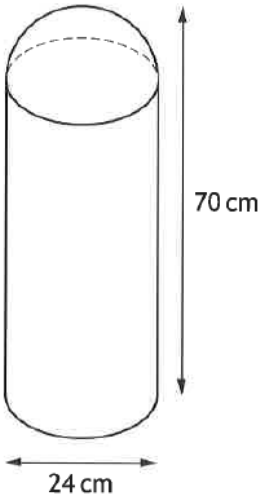
Click here for video solution.

2019 - Paper 2 - Question 8

A traffic bollard is in the shape of a cylinder with a hemisphere on top.

The bollard has

- diameter 24 centimetres
- height 70 centimetres.

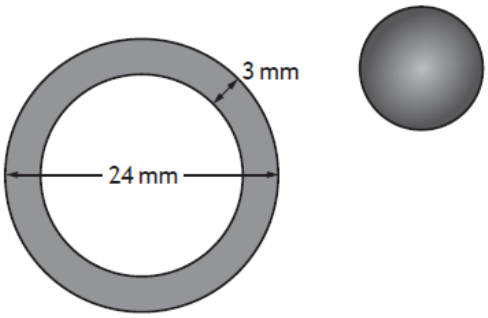


Calculate the volume of the bollard.
Give your answer correct to 3 significant figures. 5

Click here for video solution.

2017 - Paper 2 - Question 6

A spherical sweet is made by coating a caramel sphere evenly with chocolate.
A cross-section of the sweet is shown below.



The diameter of the sweet is 24 millimetres and the thickness of the chocolate coating is 3 millimetres.

Calculate the volume of the chocolate coating.

Give your answer correct to 3 significant figures. 5

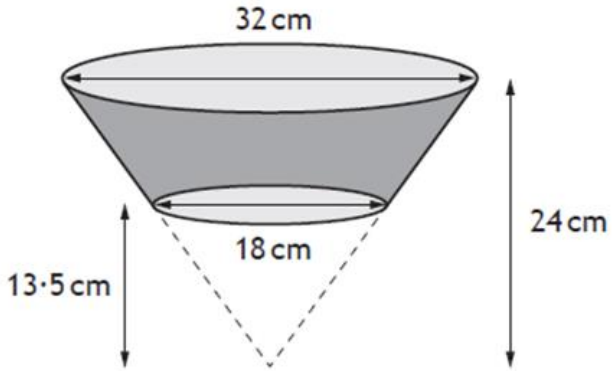
Click here for video solution.

2016 - Paper 2 - Question 7

A carton is in the shape of a large cone with a small cone removed.

The large cone has diameter of 32 cm and height 24 cm.

The small cone has diameter of 18 cm and height 13·5 cm.



Calculate the volume of the carton.

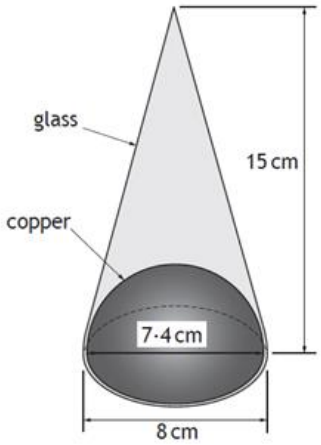
Give your answer correct to 2 significant figures. **5**

Click here for video solution.

2014 - Paper 2 - Question 7

An ornament is in the shape of a cone with diameter 8 centimetres and height 15 centimetres.

The bottom contains a hemisphere made of copper with diameter 7·4 centimetres. The rest is made of glass, as shown in the diagram below.



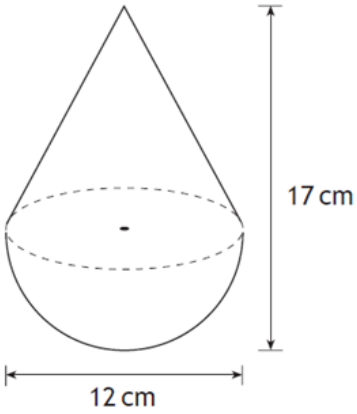
Calculate the volume of the glass part of the ornament.

Give your answer correct to 2 significant figures. **5**

Click here for video solution.

Specimen - Paper 2 - Question 6

A child's toy is in the shape of a hemisphere with a cone on top, as shown in the diagram.



The toy is 12 centimetres wide and 17 centimetres high.

Calculate the volume of the toy.

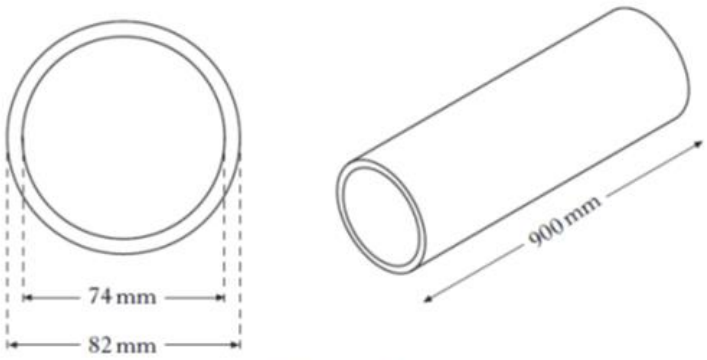
Give your answer correct to 2 significant figures. **5**

Click here for video solution.

2009 - Paper 2 - Question 3

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**

Click here for video solution.