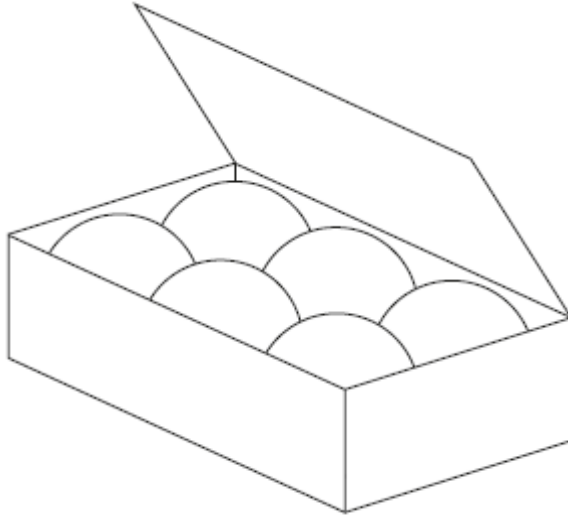## Non-Calculator

Q1.

Six balls just fit inside a box as shown.

The balls each have a diameter of 5 cm
The box is a cuboid.

Work out the volume of the box.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Answer _____ cm^3

(Total 3 marks)

Q2.

Here is a drink container and a lunch box.

The drink container is a cuboid with a square base.
The area of the base = 25 cm^2
The volume of the container = 400 cm^3

Will the container fit inside the lunch box?
You **must** show your working.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

(Total 4 marks)

Q3.

$ABCD$ is a triangular based pyramid.
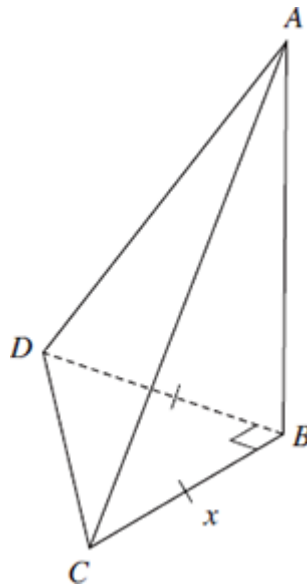The base BCD is a right-angled triangle.

A is directly above B.
$BC = BD$
$AB = 2 \times BC$
The volume of the pyramid is 72 cm³.

The formula for the volume of a pyramid is $\frac{1}{3} \times$ base area $\times$ height.

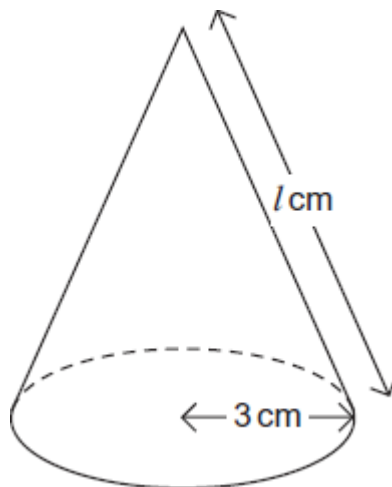Calculate the length of BC, labelled x in the diagram.

_____

_____

_____

_____

_____

_____

_____

Answer _____ cm

(Total 3 marks)

Q4.

The cone below has radius 3 cm and slant height l cm.

l cm

←3 cm→

The **total** surface area, including the base, is 24π cm^2.
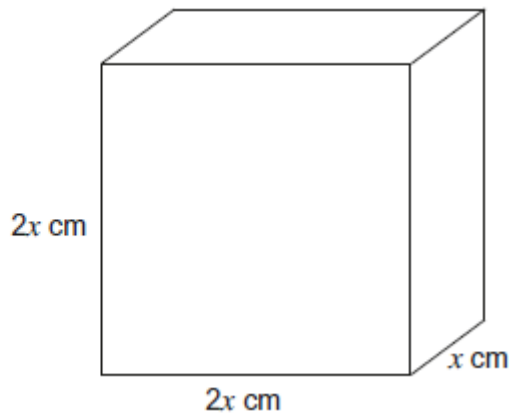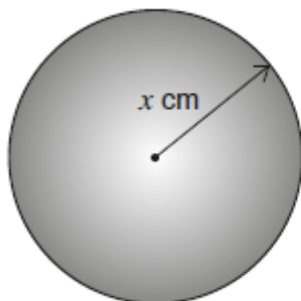
Work out the length l.

_____

_____

_____

_____

_____

Answer _____ cm

(Total 3 marks)

Q5.

A sphere has a radius of x cm

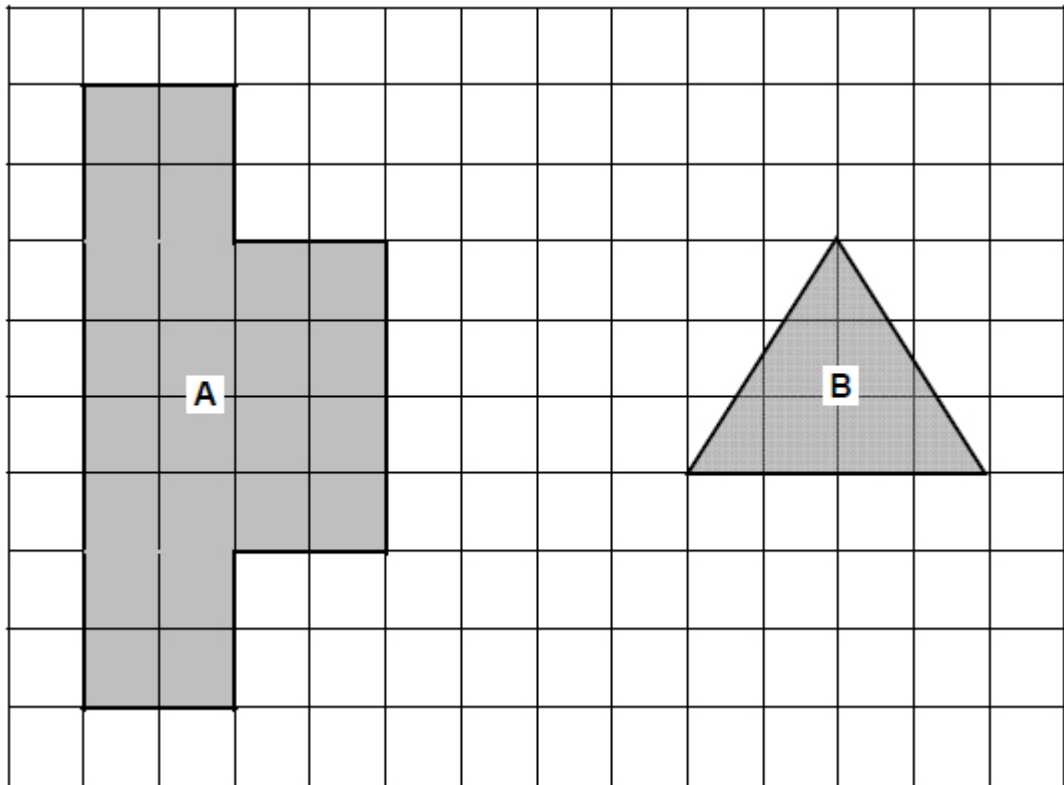A cuboid has edges of length x cm, width $2x$ cm and height $2x$ cm

Show clearly that the sphere has the larger volume.

_____

_____

_____

_____

_____

_____

_____

_____

_____

(Total 3 marks)

Calculator

Q6.

Work out   area of shape A : area of shape B

Give your answer in its simplest form.
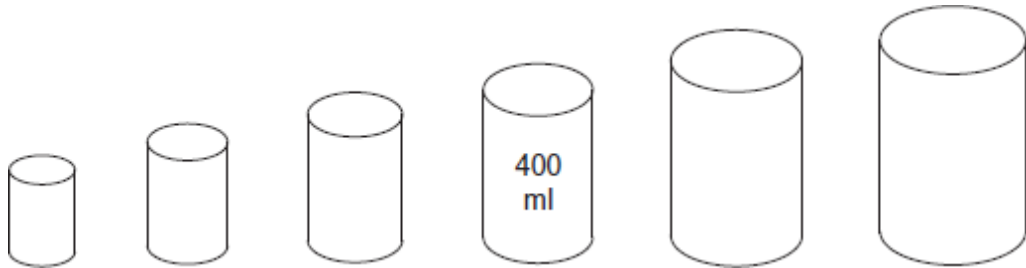
_____

_____

_____

_____

Answer _____ : _____

(Total 3 marks)

Q7.

A company makes tins in six different sizes.

For each increase in size, the capacity of the tin **doubles**.

(a)   Work out the capacity of the smallest tin.

_____

Answer _____ ml

(2)

(b)   Work out the capacity of the largest tin.
        Give your answer in litres.

_____

_____

Answer _____ litres
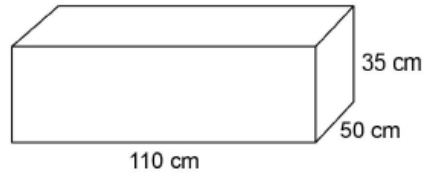
(2)
(Total 4 marks)

Q8.

Eva thinks she can save water by having a shower instead of a bath.

Eva's shower

uses 10.8 litres per minute

lasts for 8 minutes.

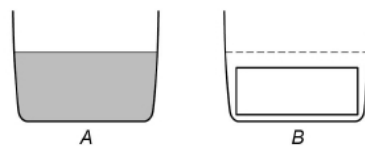Eva assumes that the water in her bath is in the shape of this cuboid.

$1000 \text{ cm}^3 = 1$ litre

(a)   Using Eva's assumption, work out how many litres of water she saves by having a shower instead of a bath.

_____

_____

_____

_____

_____

_____

Answer _____ litres

(5)

(b)   *A* shows the water level before Eva gets into the bath.
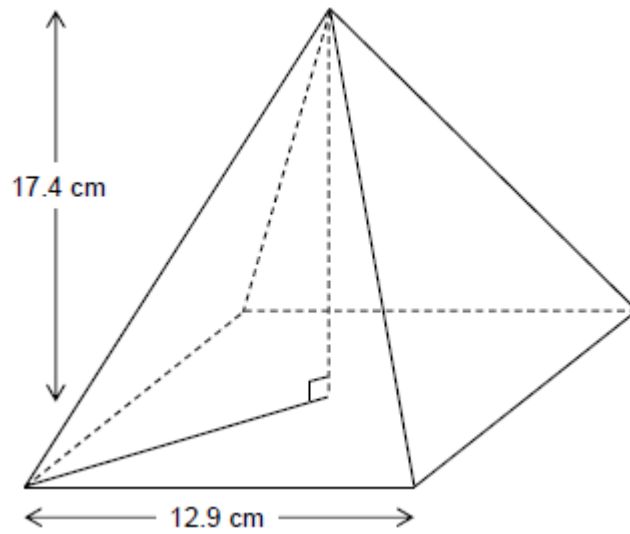*B* shows the cuboid in the empty bath.

What does this tell you about the amount of water saved?

_____

_____

(1)
(Total 6 marks)

Q9.

This pyramid has a square base.

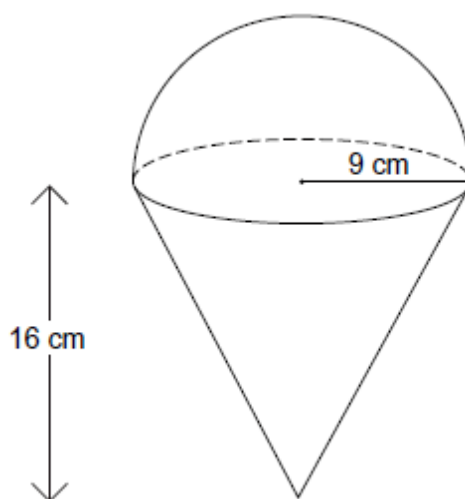Volume of a pyramid = $\dfrac{1}{3}$ × area of base × perpendicular height

Work out the volume of the pyramid.

_____

_____

_____

_____

_____

_____

Answer _____ cm²

(Total 3 marks)

Q10.

A hemisphere and a cone each have radius 9 cm

They are joined together to make a toy.

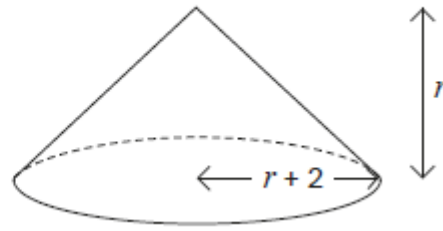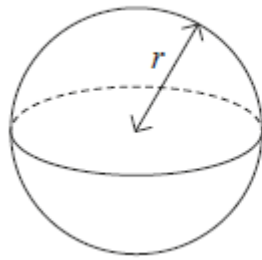Work out the total volume of the toy.

_____

_____

_____

_____

_____

_____

_____

_____

_____

Answer _____ cm^3

(Total 4 marks)

Q11.

The volume of the sphere is equal to the volume of the cone.

Work out the value of r.
Do **not** use trial and improvement.
You **must** show your working.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Answer _____ units

(Total 5 marks)

Q12.

Two spheres have radii in the ratio 5 : 3

Circle the ratio of their volumes.

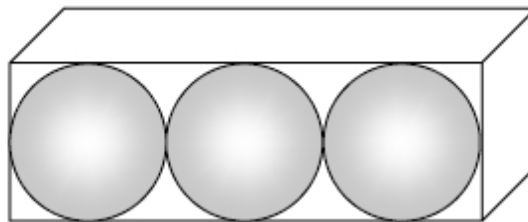5 : 3   15 : 9   25 : 9   125 : 27

(Total 1 mark)

Q13.

Volume of a sphere = $\frac{4}{3}\pi r^3$ where r is the radius.

(a)   Work out the volume of a sphere of radius 8 cm.

_____

_____

_____

_____

_____

_____

Answer _____ cm³

(2)

(b)   Three spheres of radius 8 cm are packed tightly into a cuboid as shown.

Work out the volume of the cuboid.

_____

_____

_____

_____

_____
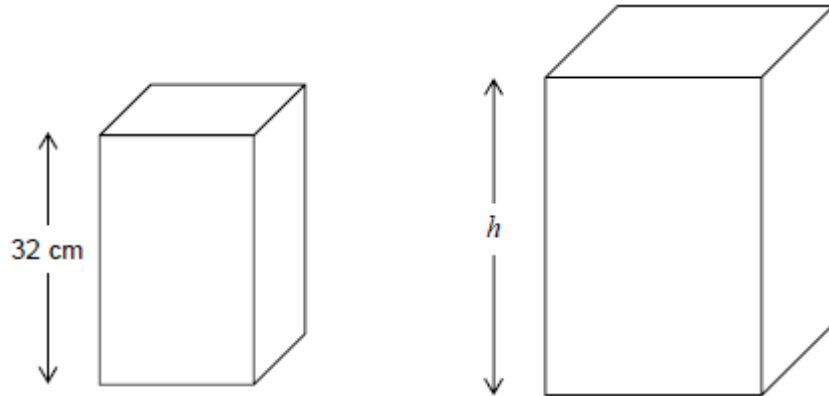
_____

Answer _____ cm³

(4)
(Total 6 marks)

Q14.

Two boxes are made with card.

The boxes are similar cuboids.

The smaller box has height 32 cm

It takes 44% more card to make the larger box.

Work out the height, h, of the larger box.

_____

_____

_____

_____

_____

Answer _____ cm

(Total 4 marks)