

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Geometry

Volume – Finding the volume of cubes and cuboids

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

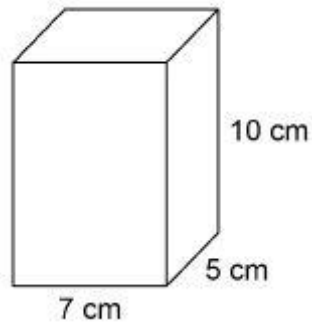
- In all calculations, show clearly how you work out your answer

For question 1, you must **NOT** use a calculator.



Q1.

Here is a cuboid.



Work out the volume.

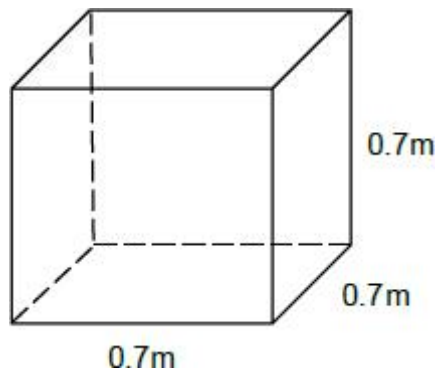
(Total 2 marks)

For questions 2 to 8, you may use a calculator.



Q2.

A cube has edges of length 0.7 metres.

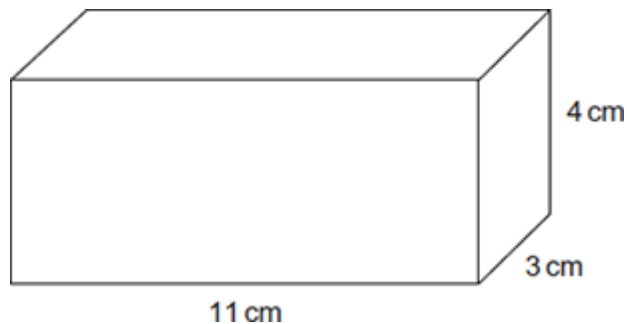


Work out the volume of the cube.

(Total 2 marks)

Q3.

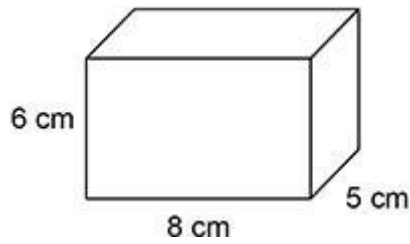
Work out the volume of the cuboid.



(Total 2 marks)

Q4.

Here is a cuboid.

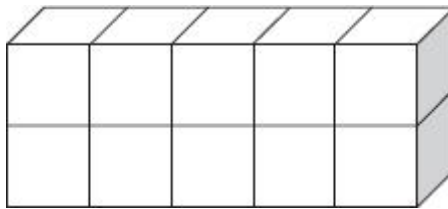


Work out the volume.

(Total 1 mark)

Q5.

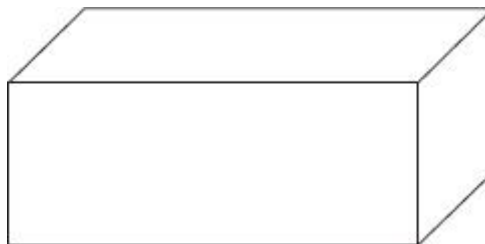
(a) This cuboid is made from centimetre cubes.



Write down the volume of the cuboid.
State the units of your answer.

(2)

(b) Here is a cuboid measuring 5cm by 2cm by 2cm.



How many centimetre cubes are needed to make this cuboid?

(2)

(Total 4 marks)

Q6.

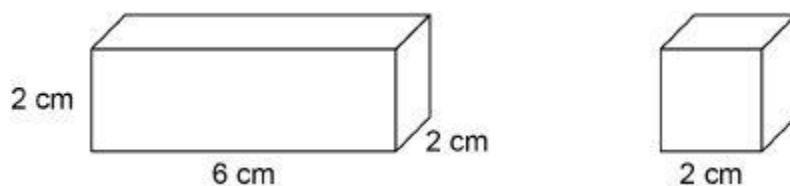


Work out the volume of the cuboid.
State the units of your answer.

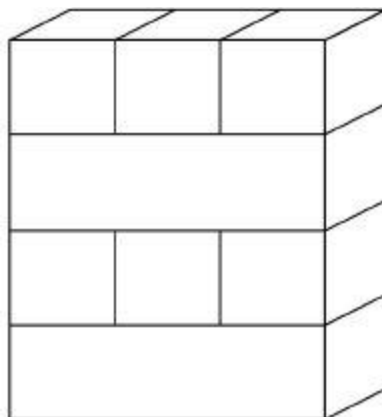
(Total 3 marks)

Q7.

Here is a small cuboid and a cube.



Small cuboids and cubes are stacked in layers to make larger cuboids.
Here is a cuboid made with four layers.



The pattern is continued to make a cuboid with volume 336 cm^3
How many **cubes** are used?

(Total 3 marks)

Q8.

Ashraf is going to put boxes into a crate.

The crate is a cuboid measuring 2.5 m by 2 m by 1.2 m

Each box is a cube of length 50 cm

He does these calculations.

volume of crate	=	$2.5 \times 2 \times 1.2$
	=	6 m^3
volume of one box	=	$0.5 \times 0.5 \times 0.5$
	=	0.125 m^3
number of boxes	=	$6 \div 0.125$
	=	48

He claims,

“I can put 48 boxes in the crate.”

Evaluate Ashraf’s method **and** claim.

(Total 2 marks)

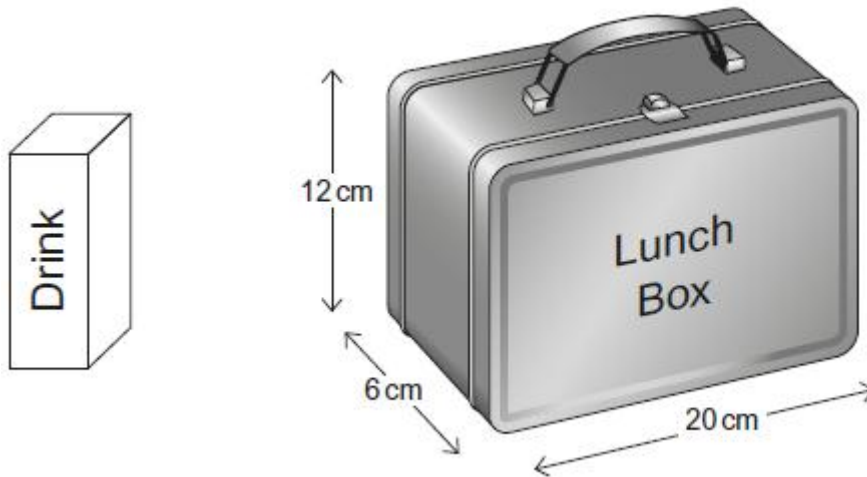
Volume – Finding the volume of cubes and cuboids – Cross topic questions

For questions 9 and 10, you must **NOT** use a calculator.



Q9.

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.

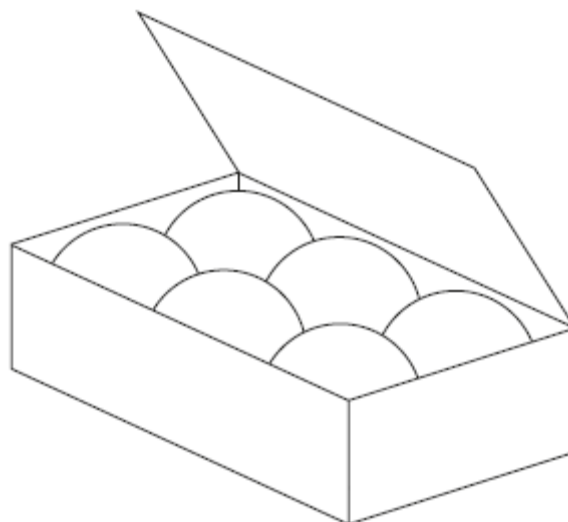
(Total 4 marks)

Q10.

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.

(Total 3 marks)

For the remaining questions, you may use a calculator.



Q11.

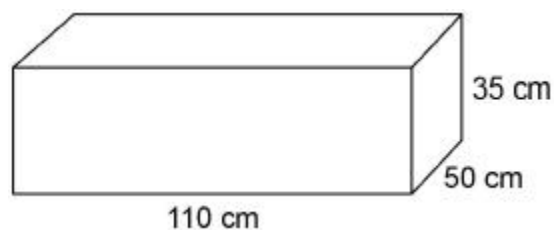
Eva thinks she can save water by having a shower instead of a bath.

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.

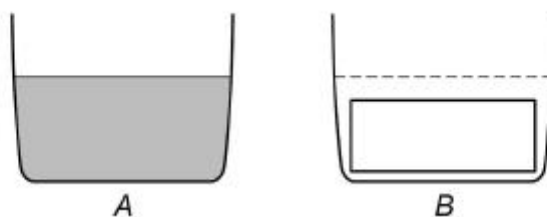


$$1000 \text{ cm}^3 = 1 \text{ litre}$$

- (a) Using Eva's assumption, work out how many litres of water she saves by having a shower instead of a bath.
- (b) A shows the water level before Eva gets into the bath.
B shows the cuboid in the empty bath.

(5)

Not drawn
accurately



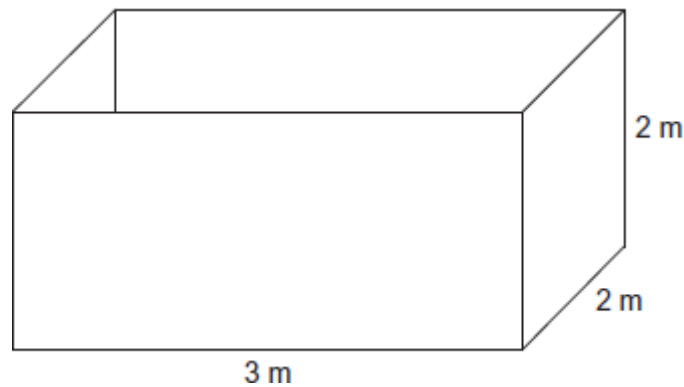
What does this tell you about the amount of water saved?

(1)

(Total 6 marks)

Q12.

An empty tank is in the shape of a cuboid as shown.



The tank is to be filled with water at 1.25 litres per second.

$1 \text{ m}^3 = 1000 \text{ litres}$

Work out the time taken to fill the tank.

Give your answer in hours and minutes.

(Total 5 marks)

Q13.

(a) How much is 1 gallon in litres?

Circle the closest estimate.

0.7 litres

2.2 litres

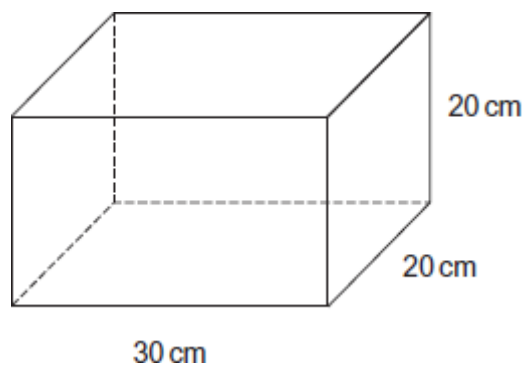
2.5 litres

4.5 litres

8.5 litres

(1)

(b) A fish tank is in the shape of a cuboid measuring 30 cm by 20 cm by 20 cm



You are given that $1000 \text{ cm}^3 = 1 \text{ litre}$

Can the fish tank hold more than 2 gallons of water?

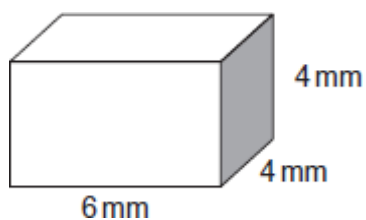
You **must** show your working.

(3)

(Total 4 marks)

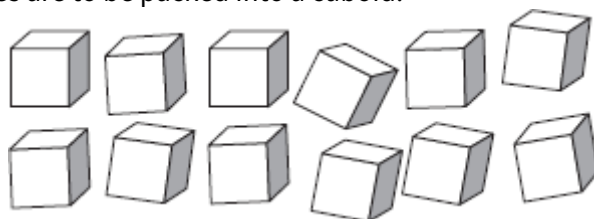
Q14.

- (a) Work out the volume of this cuboid.

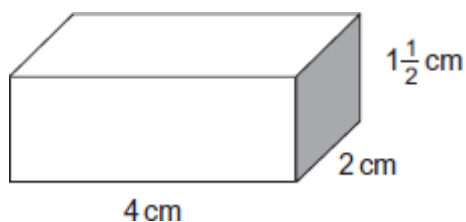


(2)

- (b) Centimetre cubes are to be packed into a cuboid.



Will these 12 cubes fit into this cuboid?



Tick a box.

☐

Yes

☐

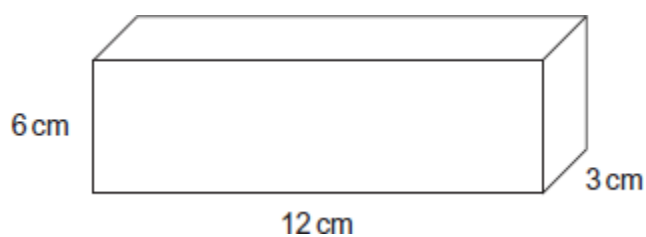
No

Give a reason for your answer.

(2)

(Total 4 marks)

Q15.



- (a) Calculate the volume of the cuboid.
State the units of your answer.

(3)

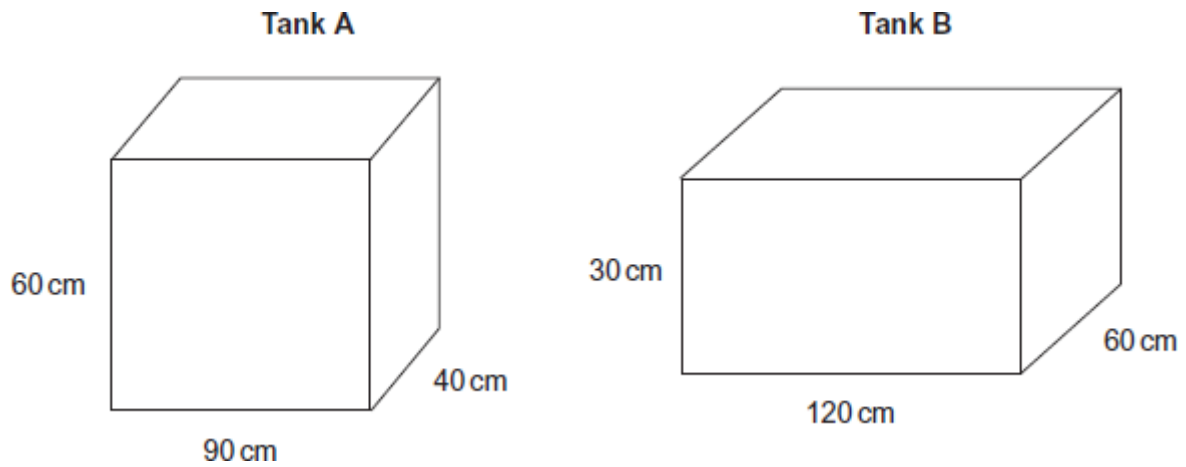
- (b) A cube has a surface area of 54 cm^2 .
How many of these cubes will fit inside the cuboid?

(4)

(Total 7 marks)

Q16.

Two empty water tanks, A and B, are in the shape of cuboids as shown.



Each tank has water added at the same constant rate.

- (a) Show that it takes the same time to fill each tank to the top.
You **must** show your working.

(3)

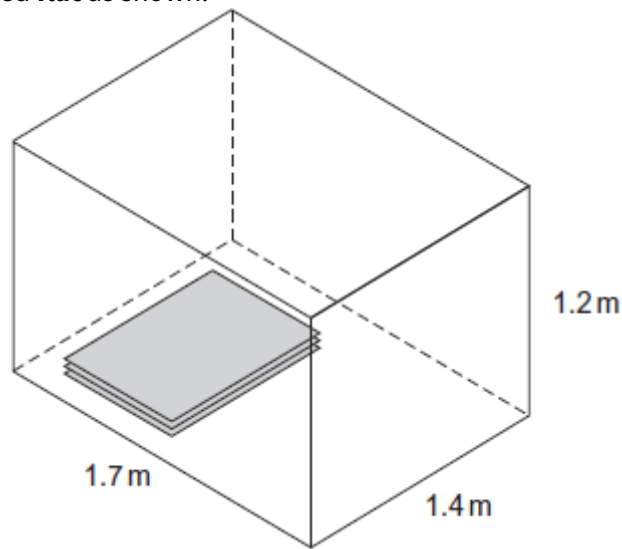
- (b) In which tank does the depth of water increase faster?
Give a reason for your answer.

(1)

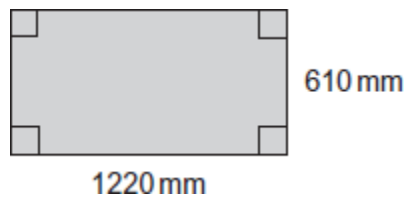
(Total 4 marks)

Q17.

The loading space in a van is in the shape of a cuboid.
Sheets of wood are loaded in the van.
The sheets are stacked **flat** as shown.



Each sheet of wood has length 1220 mm and width 610 mm.



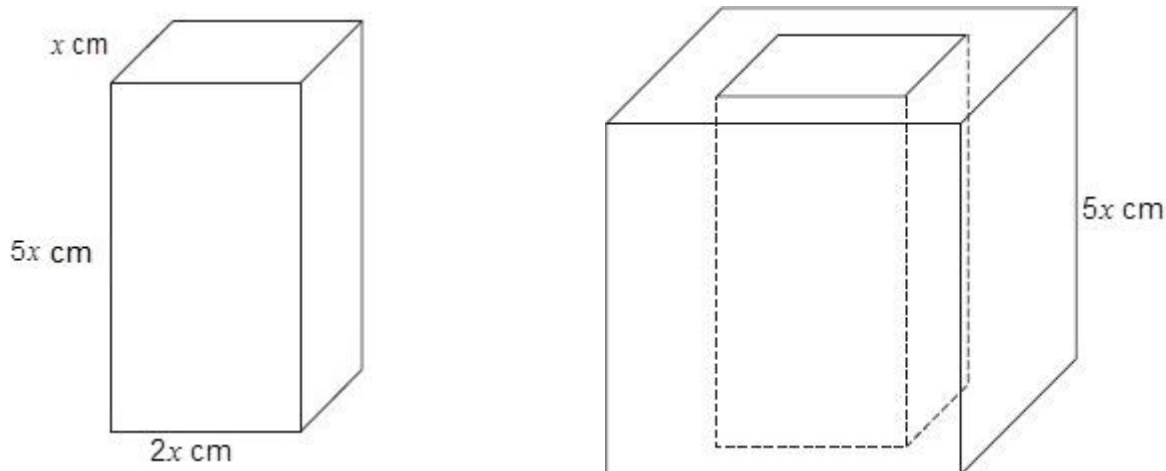
Not drawn accurately

The thickness of each sheet is 3 mm.
Can 750 sheets be loaded in the van?
You **must** show your working.

(Total 4 marks)

Q18.

The cuboid has been cut out of the wooden cube as shown.



- (a) Show clearly why the volume of wood remaining, in cubic centimetres, is $115x^3$.

(3)

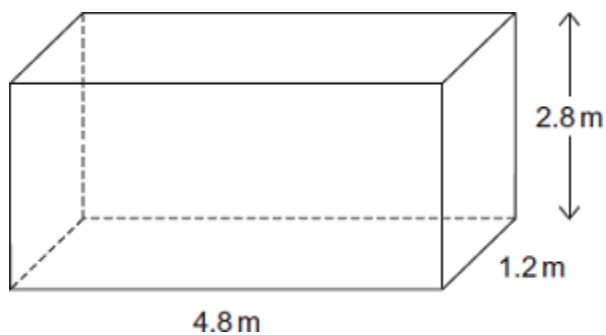
- (b) You are given that $x = 3.5$
Work out the volume of wood remaining.

(2)

(Total 5 marks)

Q19.

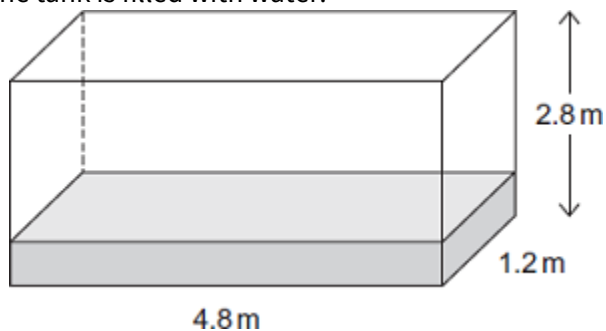
This water tank is a cuboid.



- (a) Work out the volume of the tank.
State the units of your answer.

(3)

- (b) One quarter of the tank is filled with water.



1 cubic metre holds 1000 litres of water.
Work out how many **more** litres of water are needed to fill the tank.

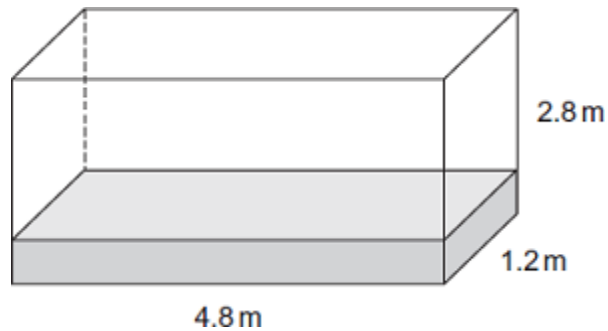
(3)

(Total 6 marks)

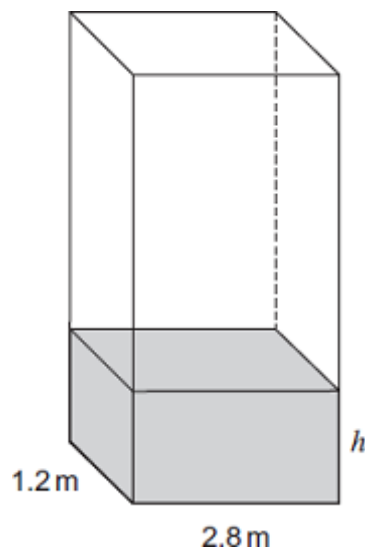
Q20.

The measurements on this tank are exact.

Water is put in the tank to a height of 0.7m **to the nearest tenth of a metre**.



The tank is now turned on its side as shown.



Work out the minimum height of water in the tank, marked, h .

Give your answer to 1 decimal place.

(Total 5 marks)

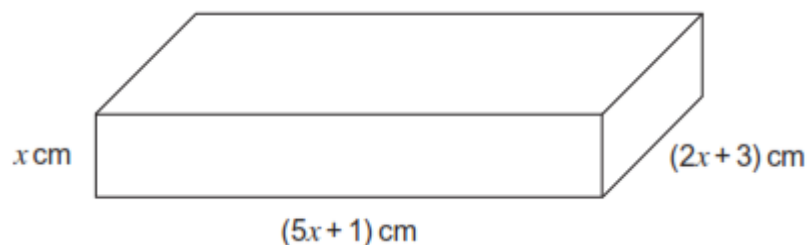
Q21.

The diagram shows a cuboid.

The length is $(5x + 1)$ cm.

The width is $(2x + 3)$ cm.

The height is x cm.



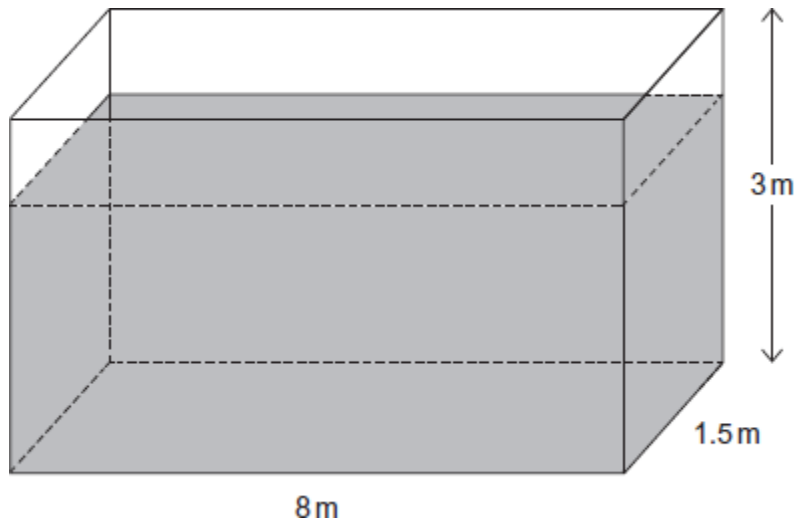
The length is 7 cm longer than the width.

Work out the volume of the cuboid.

(Total 5 marks)

Q22.(H)

This water tank is a cuboid.

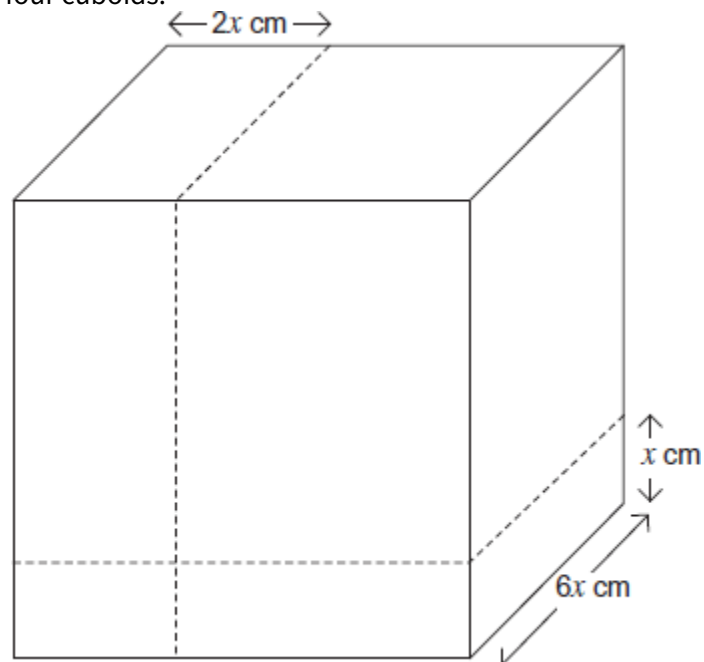


You are given that 1 cubic metre holds 1000 litres.
The tank is five-sixths full of water.
Water is leaking from the tank at a rate of 20 litres per minute.
How long will it take the tank to empty?
Give your answer in hours.

(Total 5 marks)

Q23.(H)

A cube is cut into four cuboids.



Write the volume of the **smallest** cuboid as a fraction of the volume of the cube.
Give your answer in its simplest form.

(Total 3 marks)