**Volume and Surface Area (F)**

Intervention Booklet

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Useful websites:**

**www.mathswatchvle.com**

*(Video explanations and questions)*

Username: STH…@twgash

Password: stmaths

**www.methodmaths.com**

*(Past papers online that get instantly marked)*

Centre ID: wga

Username: firstname

Password: lastname

**www.hegartymaths.com**

*(Online tutorials and quizzes)*

Login: first name and last name are case sensitive

**www.bbc.co.uk/schools/gcsebitesize/maths**

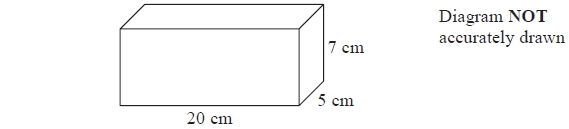
**Cubes and Cuboids**

**Things to remember:**

* The volume of a cube or cuboid = base x depth x height.
* To calculate the surface area, work out the area of the surface! (Add together the areas of all 6 faces)

**Questions:**

**1.** The diagram shows a cuboid.

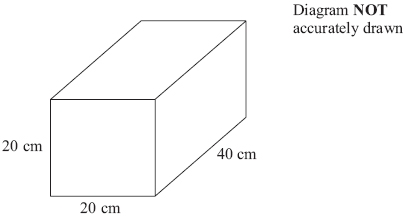


Work out the volume of the cuboid.

...........................................................

**(Total for Question is 3 marks)**

**2**. Here is a cuboid.

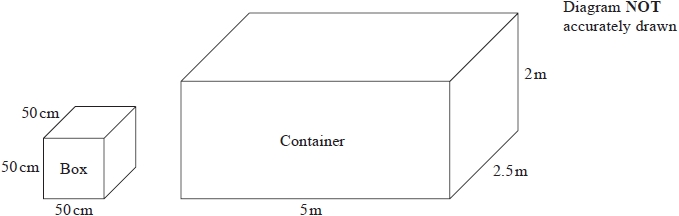


Work out the volume of the cuboid.

...........................................................

**(Total for Question is 3 marks)**

**3**.



Chao transports microwave ovens from China to the UK.

He puts each microwave oven in a box.   
Each box is a cube of side 50cm.

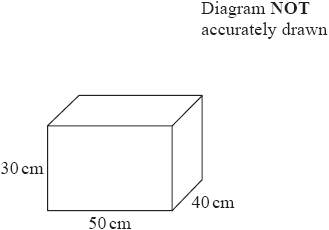
He then puts each box in a container.   
Each container is a cuboid of size 5m by 2.5m by 2m.

Chao has 500 boxes.   
He has 3 containers.

Will the 500 boxes fit into these 3 containers?

**(Total for question = 4 marks)**

**4**.



The diagram shows a container for oil.   
The container is in the shape of a cuboid.   
The container is empty.

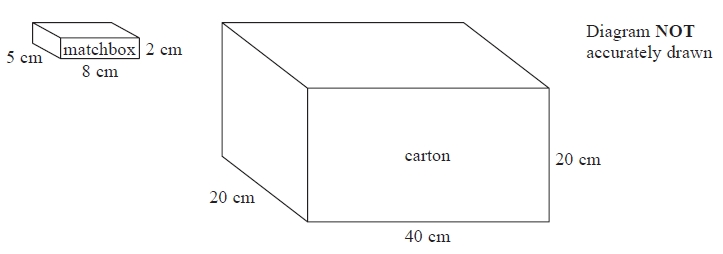
Sally has to fill the container with oil.   
A bottle of oil costs £ 3.50   
There are 3000 cm3 of oil in each bottle.

Sally must not spend more than £ 60 buying the oil.

Can Sally buy enough oil to fill the container?   
You must show all your working.

**(Total for question = 4 marks)**

**5.**



A matchbox is 5 cm by 8 cm by 2 cm.   
A carton is 20 cm by 40 cm by 20 cm.

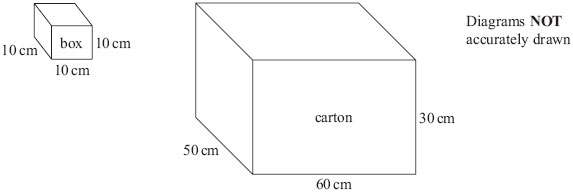
The carton is completely filled with matchboxes.

Work out the number of matchboxes in the carton.

...........................................................

**(Total for Question is 3 marks)**

**6**.



Terry fills a carton with boxes.  
 Each box is a cube of side 10 cm.

The carton is a cuboid with

Length 60 cm

Width 50 cm

Height 30 cm

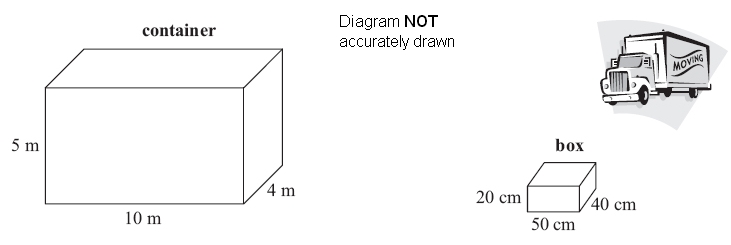
Work out the number of boxes Terry needs to fill one carton completely.

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**(Total for Question is 3 marks)**

**7**. Marc drives a truck. The truck pulls a container.

The container is a cuboid 10 m by 4 m by 5 m.



Marc fills the container with boxes.  
Each box is a cuboid 50 cm by 40 cm by 20 cm.

Show that Marc can put no more than 5000 boxes into the container.

**(Total for Question is 4 marks)**

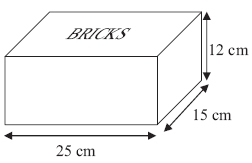
**8.** A company makes building bricks for children.  
The bricks are all 5 cm cubes.

The bricks are going to be packed in boxes.

John designs a box for the bricks.  
The box is a cuboid.

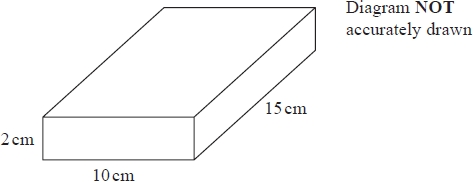
The size of the box is 25 cm by 15 cm by 12 cm.

Will the box be big enough for 36 bricks?  
You must give reasons for your answer.



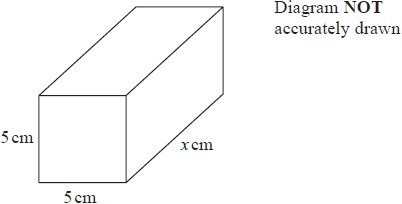
**(Total for Question is 4 marks)**

**9**. Jane makes cheese. The cheese is in the shape of a cuboid.



Jane is going to make a new cheese.

The new cheese will also be in the shape of a cuboid.   
The cross section of the cuboid will be a 5cm by 5cm square.



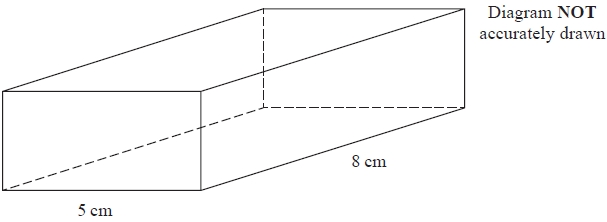
Jane wants the new cuboid to have the same volume as the 2cm by 10cm by 15cm cuboid.

Work out the value of *x*.

...........................................................

**(Total for question = 3 marks)**

**10.** The diagram shows a cuboid.



The width of the cuboid is 5 cm.   
The length of the cuboid is 8 cm.

The volume of the cuboid is 120 cm3.

Work out the height of the cuboid.

........................................................... cm

**(Total for question = 2 marks)**

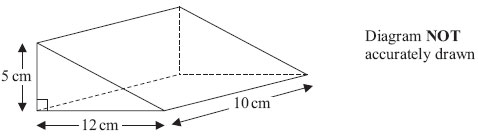
**Prisms (Including Cylinders)**

**Things to remember:**

* Volume of a prism = area of cross section x vertical height
* Area of triangle = b x h
* Area of circle = π r²
* To calculate the surface area, work out the area of the surface!

**Questions:**

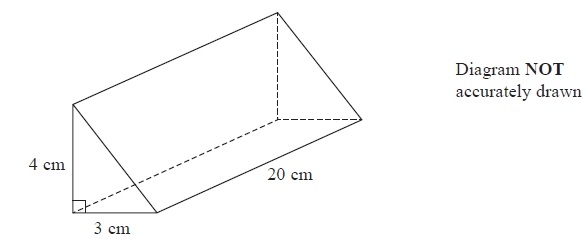
**1.** Work out the volume of the triangular prism.



...........................................................cm3

**(Total for Question is 2 marks)**

**2.** Here is a triangular prism.

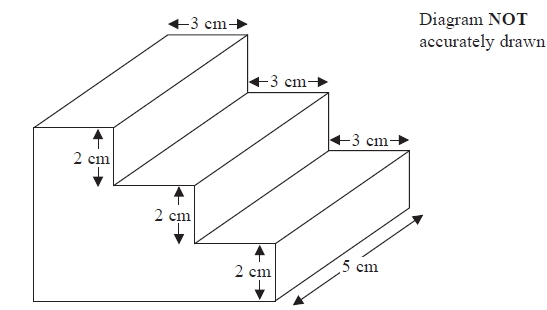


Work out the volume of this triangular prism.

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**(Total for Question is 4 marks)**

**3.** The diagram shows a prism.



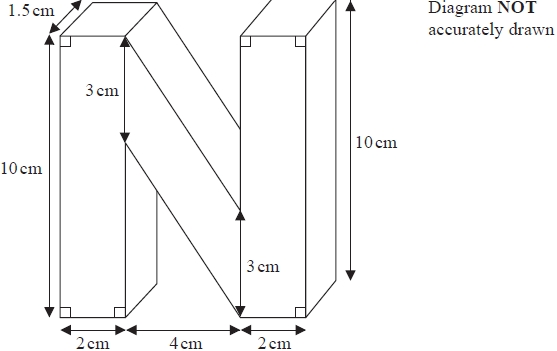
All the corners are right angles.

Work out the volume of the prism.

...........................................................cm3

**(Total for question = 3 marks)**

**4**. Here is a prism.

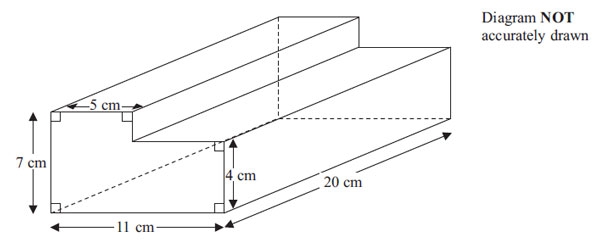


Work out the volume of the prism.

...........................................................cm3

**(Total for question = 4 marks)**

**5.** Here is a solid prism.

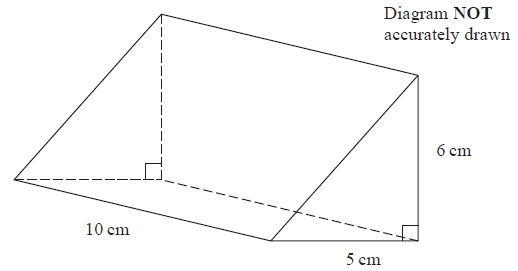


Work out the volume of the prism.

...........................................................cm3

**(Total for Question is 3 marks)**

**6**. The diagram shows a triangular prism.

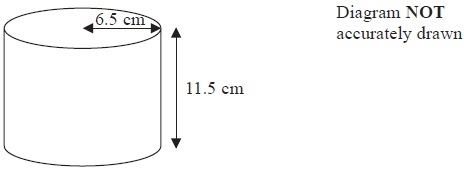


Work out the volume of the prism.

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**(Total for question = 3 marks)**

**7**. The diagram shows a large tin of pet food in the shape of a cylinder.



The large tin has a radius of 6.5 cm and a height of 11.5 cm.

A pet food company wants to make a new size of tin.

The new tin will have a radius of 5.8 cm.

It will have the same volume as the large tin.

Calculate the height of the new tin.

Give your answer correct to one decimal place.

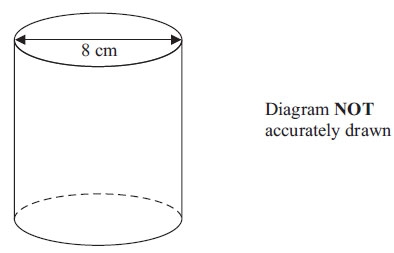
........................................................... cm  
**(Total for Question is 3 marks)**

**8.** Ella is designing a glass in the shape of a cylinder.

The glass must hold a minimum of ½ litre of liquid.

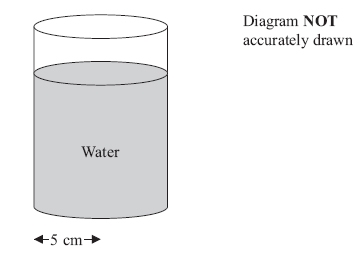
The glass must have a diameter of 8 cm.

Calculate the minimum height of the glass.



........................................................... cm  
 **(Total for Question is 5 marks)**

**9.** Here is a vase in the shape of a cylinder.



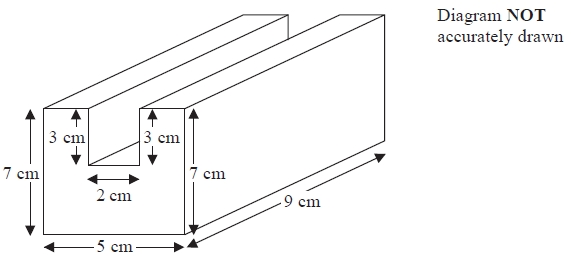
  The vase has a radius of 5 cm.

There are 1000 cm3 of water in the vase.

Work out the depth of the water in the vase.  
 Give your answer correct to 1 decimal place.

........................................................... cm  
 **(Total for Question is 3 marks)**

**10.** The diagram shows a prism.



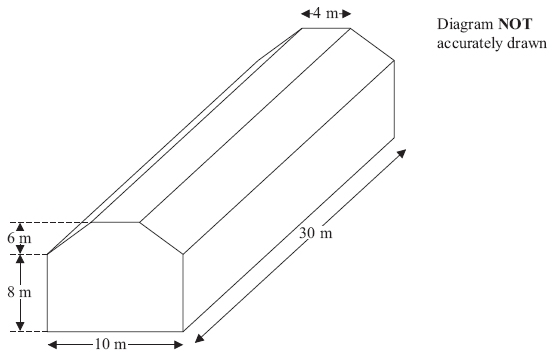
All the corners are right angles.

Work out the volume of the prism.

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**(Total for question = 4 marks)**

**11.** The diagram represents a shed.



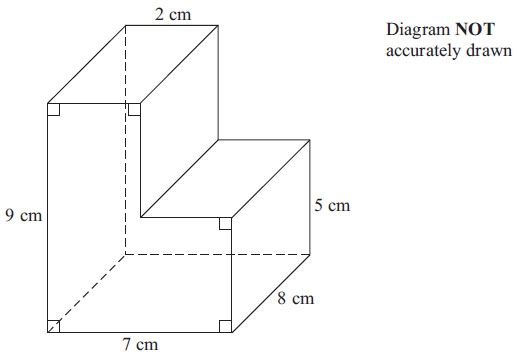
The shed is in the shape of a prism.  
The cross section of the prism is a hexagon.   
The hexagon has one line of symmetry.  
The walls of the shed are vertical.

Calculate the volume of the shed.

........................................................... m3

**(Total for Question is 4 marks)**

**12.** The diagram shows an L-shaped prism.



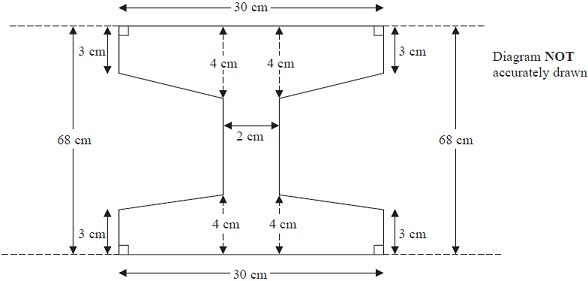
Calculate the volume of the prism.

........................................................... cm3

**(Total for Question is 3 marks)**

**13.** Here is the cross section of a steel girder.

The cross section has two lines of symmetry.



The girder is a prism.

The length of the girder is 200 cm.

Work out the volume of the girder.

........................................................... cm3

**(Total for Question is 5 marks)**