

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Geometry

Nets of 3D shapes, plans and elevations

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

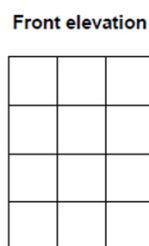
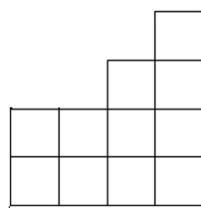
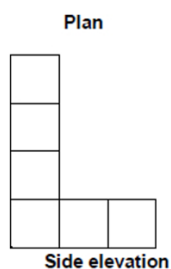
- In all calculations, show clearly how you work out your answer

For questions 1 to 5 you must **NOT** use a calculator.

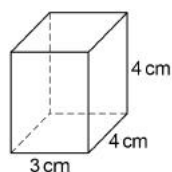


Q1.

A solid shape is made from centimetre cubes.
Here are the plan, side elevation and front elevation of the shape.



Centimetre cubes are added to make this cuboid.



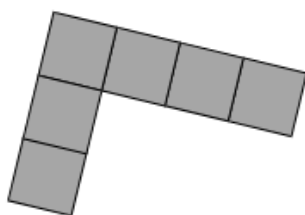
How many cubes are added?

(Total 3 marks)

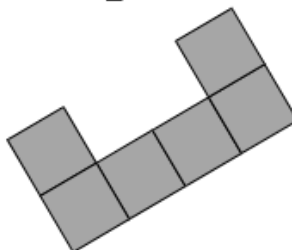
Q2.

Which of these is the **net** of a **cube**?
Circle the correct letter.

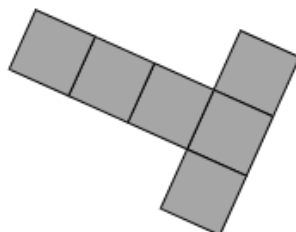
A



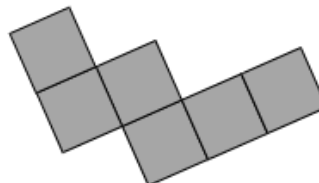
B



C



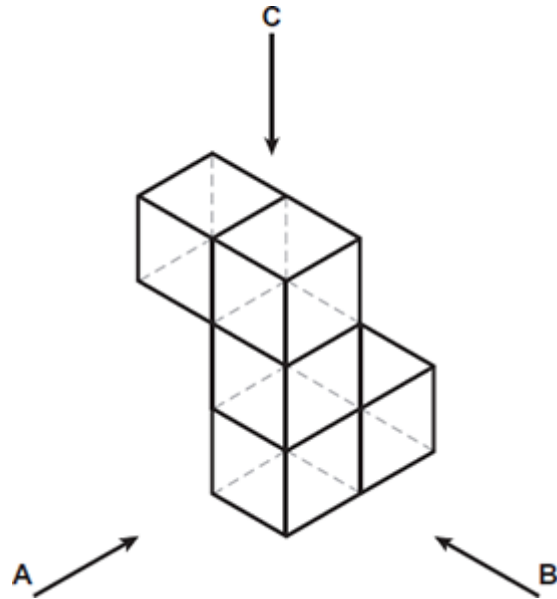
D



(Total 1 mark)

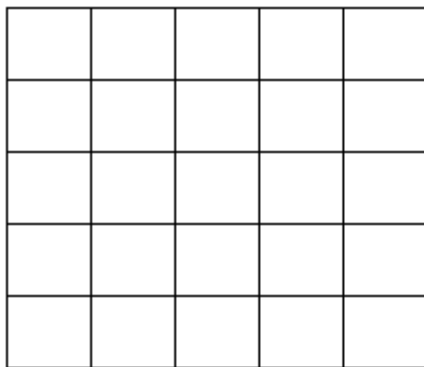
Q3.

This shape is made from **five** cubes.

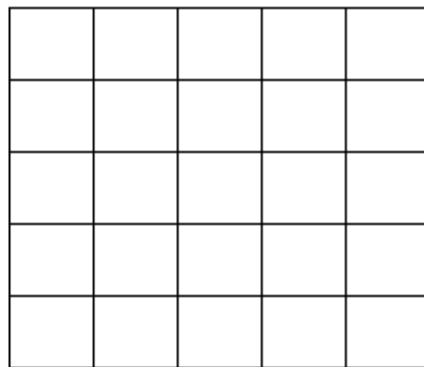


Draw what the shape looks like when seen from A, B and C.

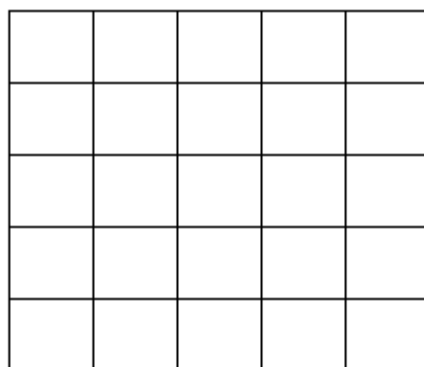
From A



From B



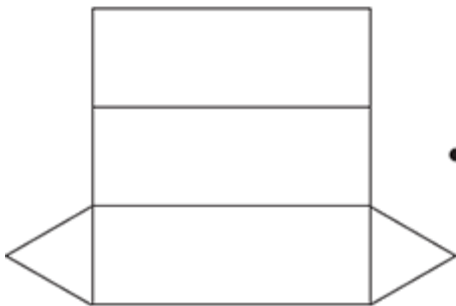
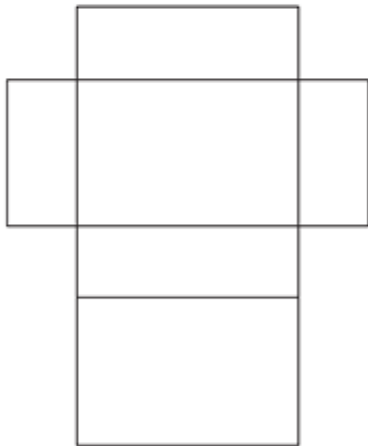
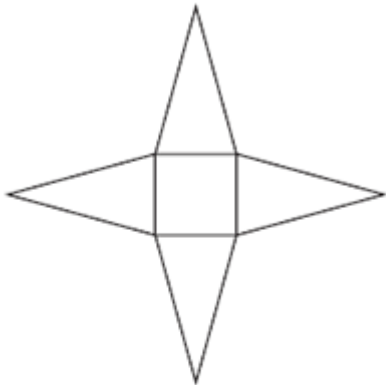
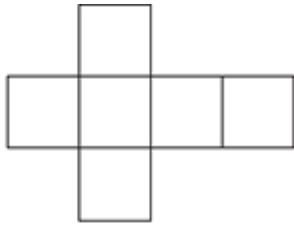
From C



(Total 3 marks)

Q4.

Match each net with a solid.
The first one has been done.

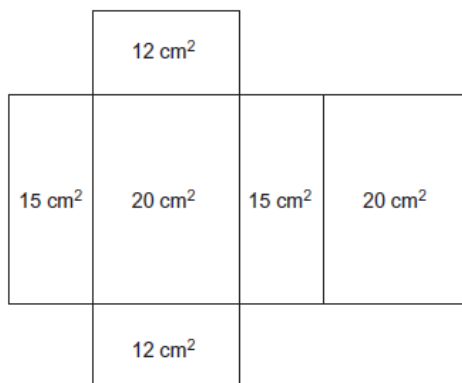
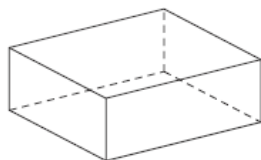


- Cuboid
- Pyramid
- Cylinder
- Cube
- Triangular prism

(Total 3 marks)

Q5.

Here is the net of a cuboid.
The net shows the area of each face.



Not drawn accurately

Work out the **volume** of the cuboid.

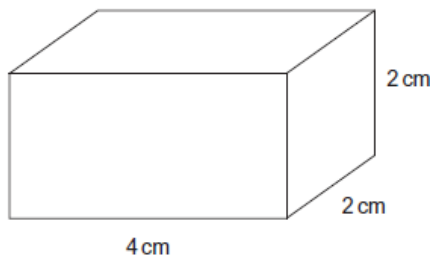
(Total 4 marks)

For the rest of the questions, you may use a calculator.

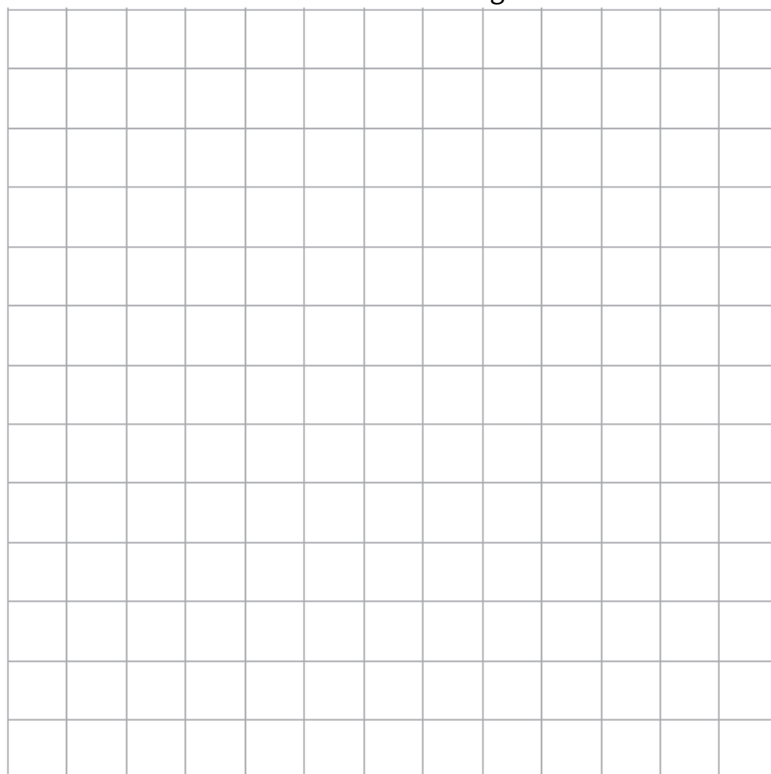


Q6.

The diagram shows a cuboid.



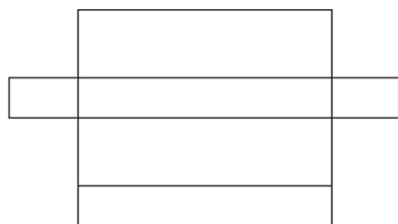
Draw an accurate net of the cuboid on this centimetre grid.

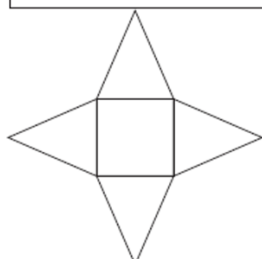


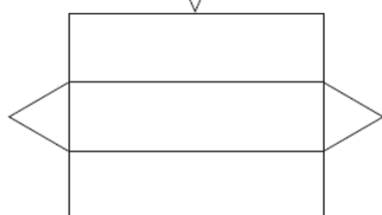
(Total 3 marks)

Q7.

Write down the mathematical name of the shape made by each net.



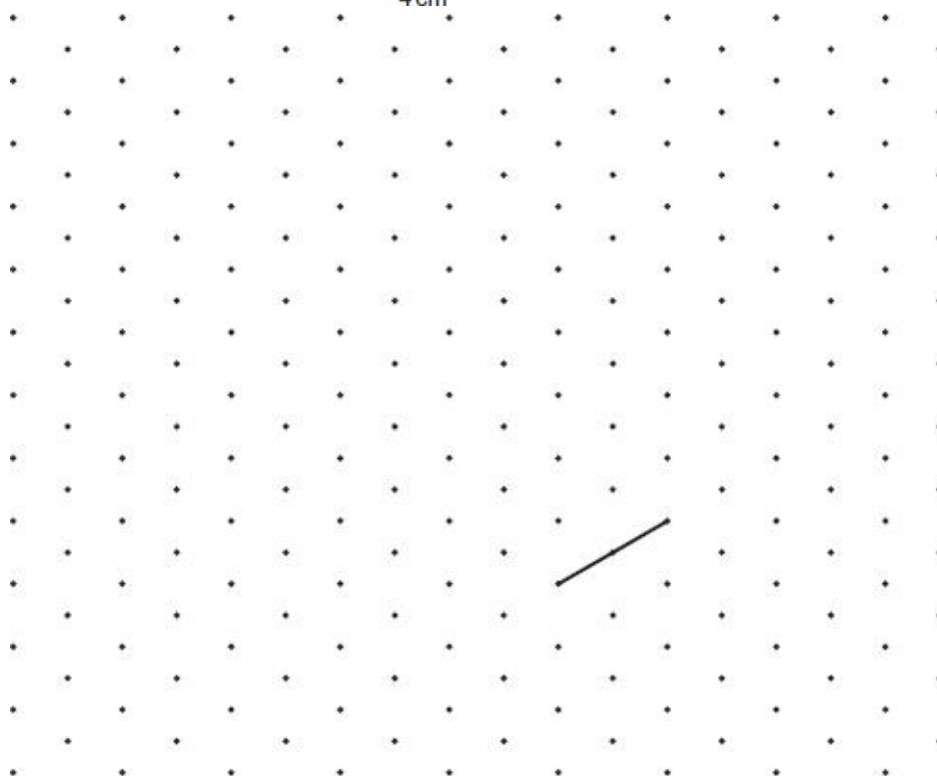
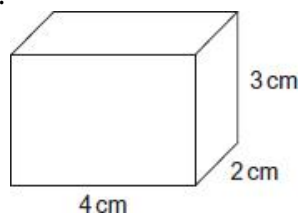




(Total 3 marks)

Q8.

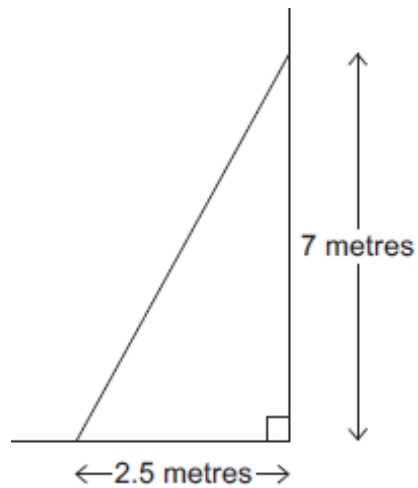
Make an accurate drawing of this cuboid on the isometric grid.
One edge has been drawn for you.



(Total 2 marks)

Q9.

- (a) The diagram shows a sketch of a ladder on horizontal ground against a vertical wall.
Not drawn accurately



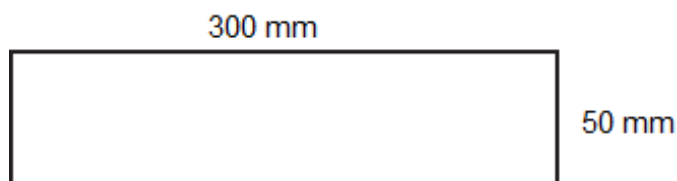
Make an accurate scale drawing.
The horizontal ground has been drawn for you.
Use a scale of 1 cm to represent 1 metre.

- (b) Use your drawing to work out the actual length of the ladder. (2)
- (1)
- (Total 3 marks)**

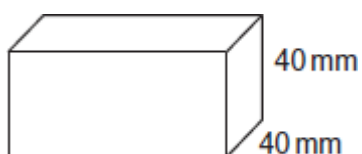
Q10.

- (a) The diagram shows a letterbox.

Not drawn
accurately

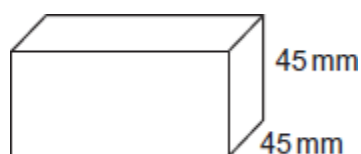


Which of these parcels will fit through the letterbox?
Circle Yes or No for each parcel.



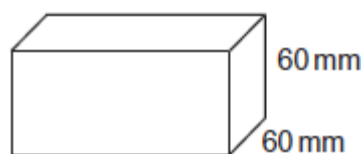
220 mm

Yes No



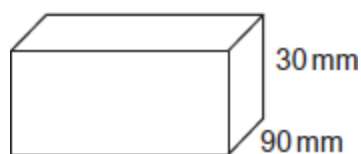
340 mm

Yes No



100 mm

Yes No



280 mm

Yes No

(4)

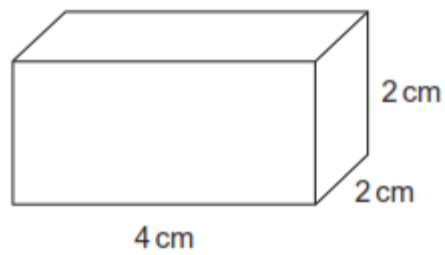
- (b) Pat wants a letterbox that all four of the parcels will fit through.
What is the width and height of the smallest letterbox possible?

(3)

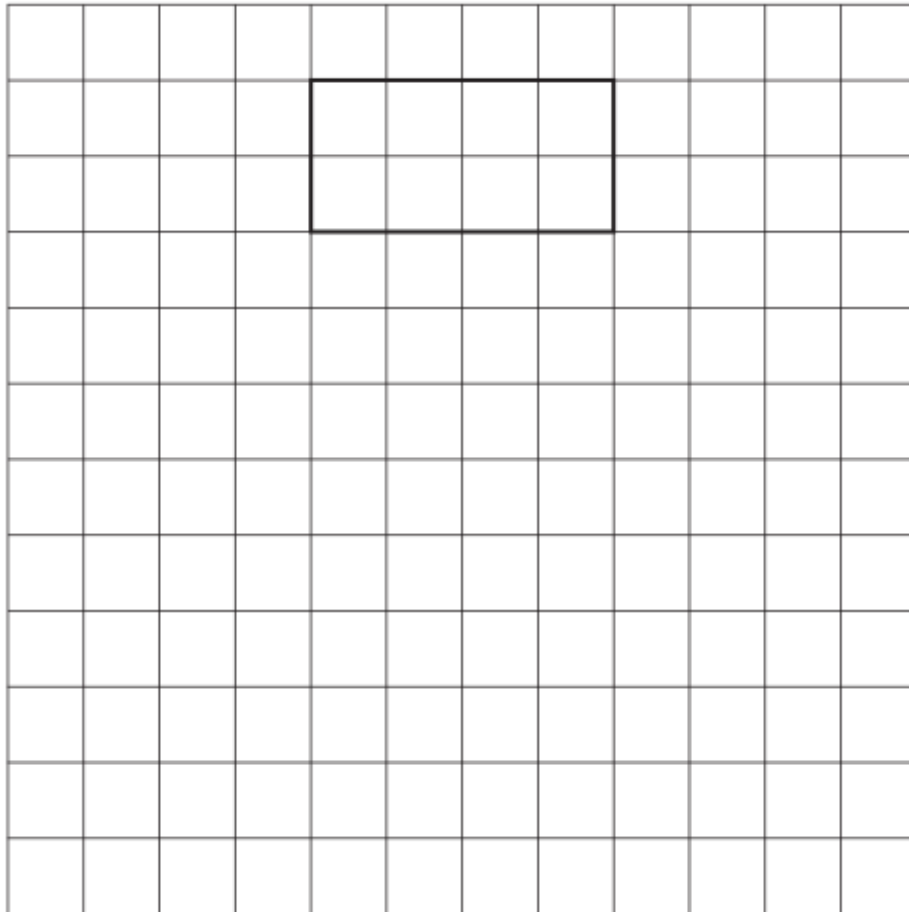
(Total 7 marks)

Q11.

The diagram shows a cuboid.



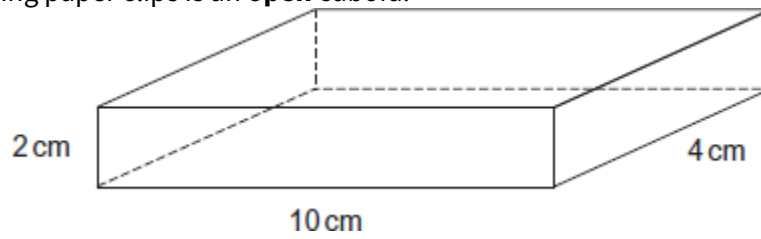
On the centimetre grid, complete a possible net for the cuboid.
One face has been drawn for you.



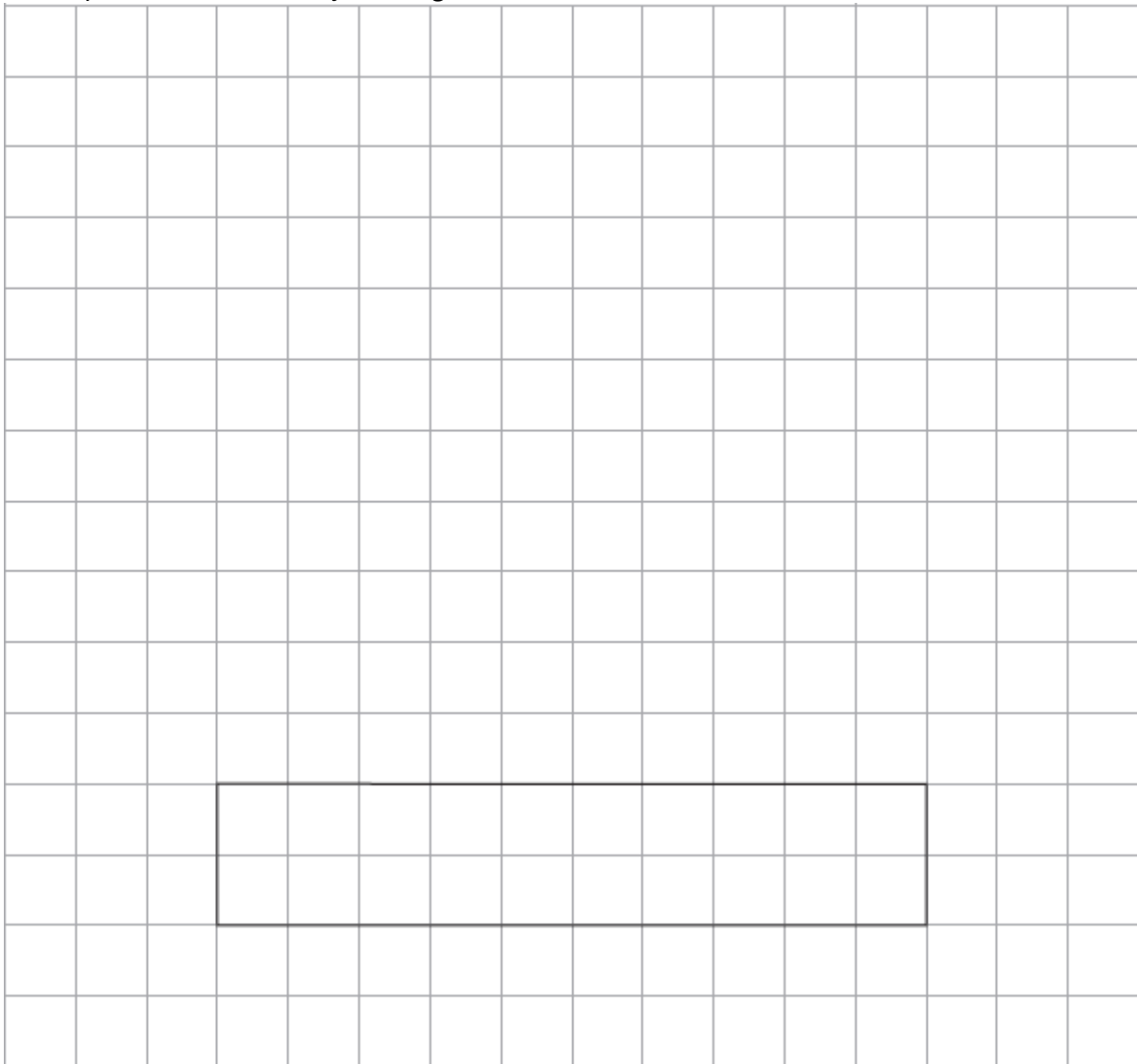
(Total 3 marks)

Q12.

A tray for holding paper clips is an **open** cuboid.



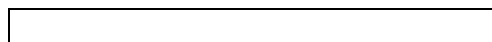
Complete a net for the tray on the grid.



(Total 3 marks)

Q13.

Here is the plan of a solid.



Circle the solid that it could be.

sphere

cone

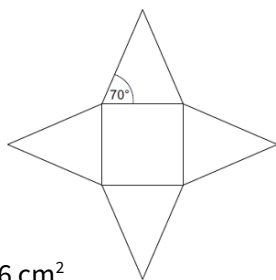
hemisphere

cylinder

(Total 1 mark)

Q14.

The diagram shows the net of a square-based pyramid.



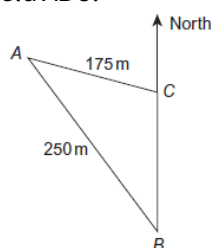
Not drawn accurately

The area of the square base is 36 cm^2 .
Work out the area of one triangular face.

(Total 5 marks)

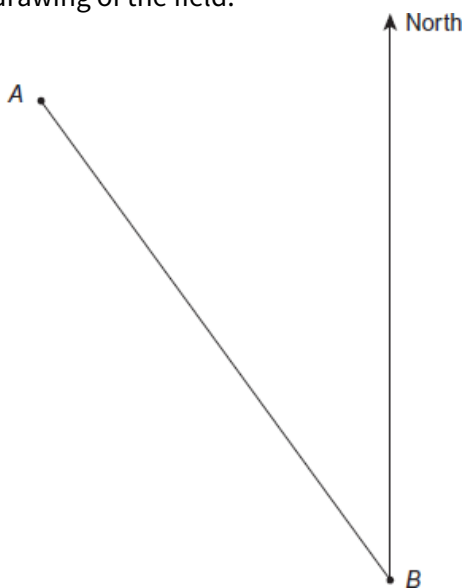
Q15.

(a) Here is a sketch of a triangular field ABC .



Not drawn accurately

Complete this scale drawing of the field.



(3)

(b) $PQRS$ represents a garden.



A straight path across the garden is the same distance from PQ and PS .
Use ruler and compasses to construct the position of the path.

(2)

(Total 5 marks)

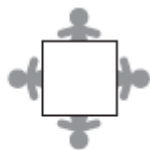
Q16.

Square tables are put in rows.

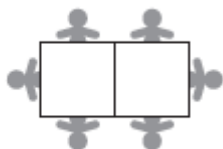
One person can sit at each available edge of a table.

People can **not** sit at an edge where two tables join.

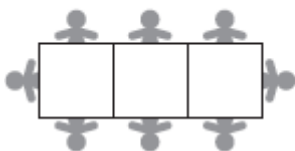
Examples



A single table
4 people



A row of 2 tables
6 people



A row of 3 tables
8 people

- (a) How many people can sit at a row of 7 tables?

(2)

- (b) 12 tables are put in a room.

There must be

only one row of 4 tables

no single tables.

Show how the 12 tables can be arranged so that **exactly** 30 people can sit at the tables.

Practise on this diagram of the room.



Put your final answer on this diagram of the room.



(3)

(Total 5 marks)

Q17.

- (a) Match each shape to its number of sides.
One has been done for you.

Hexagon

Quadrilateral

Triangle

Pentagon

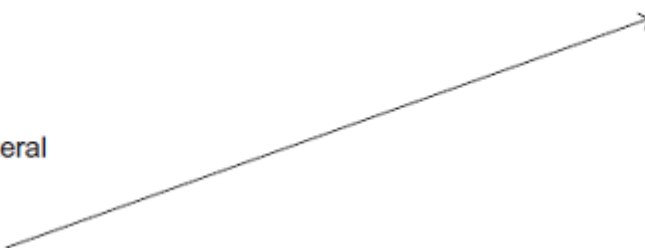
3 sides

4 sides

5 sides

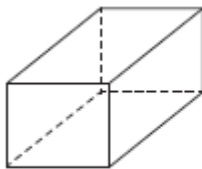
6 sides

8 sides

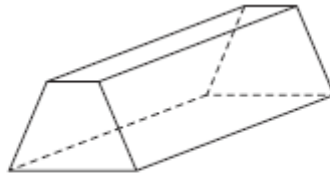


(3)

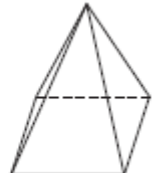
- (b)



shape A

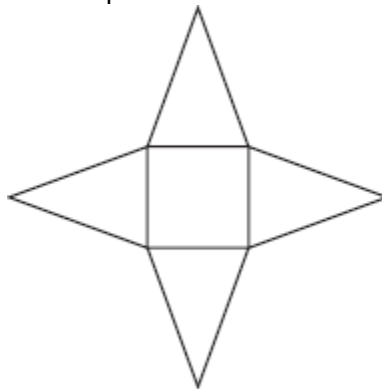


shape B



shape C

Here is a net for one of these shapes.



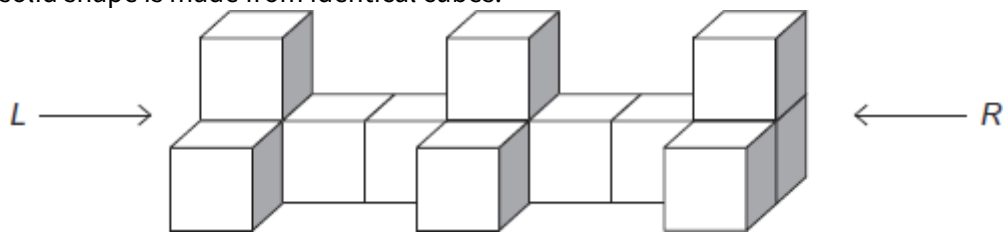
Which shape is it?

(1)

(Total 4 marks)

Q18.

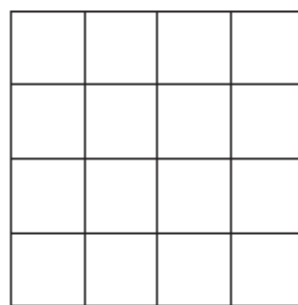
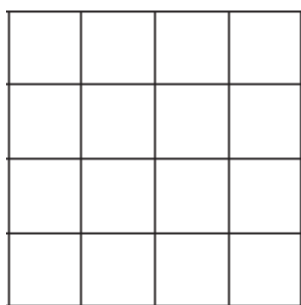
This solid shape is made from identical cubes.



- (a) On the grids draw the side elevations L and R .

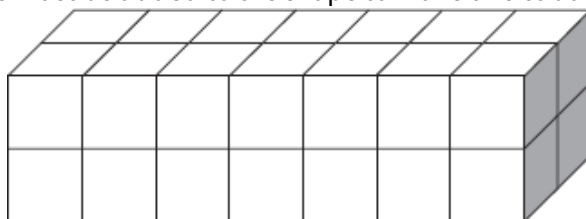
L

R



(2)

- (b) How many cubes must be **added** to the shape to make this cuboid?



(2)

(Total 4 marks)

Q19.

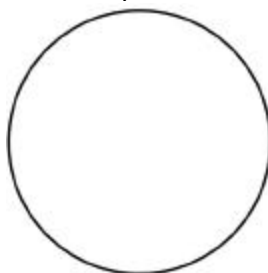
The front elevation, side elevation and plan of a solid are all the same, as shown.



- (a) Write down the name of the solid.

(1)

- (b) The front elevation, side elevation and plan of a solid are all the same, as shown.



Write down the name of the solid.

(1)

(Total 2 marks)

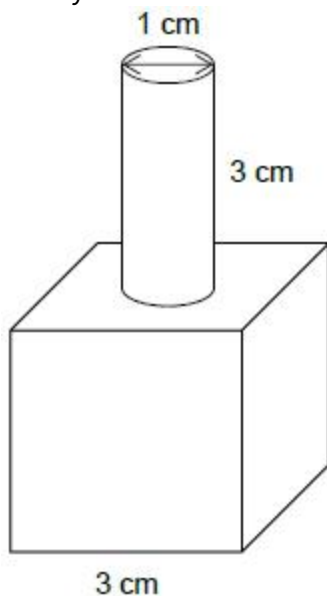
Q20.

A solid shape is made with a cube and a cylinder.

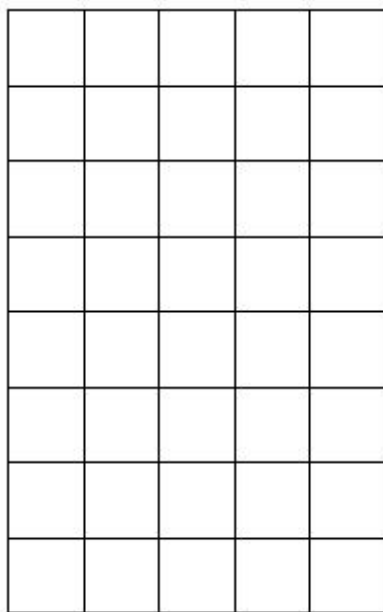
The cube has edge length 3 cm

The cylinder has diameter 1 cm and height 3 cm

- (a) The cylinder sits symmetrically on the centre of the top of the cube as shown.

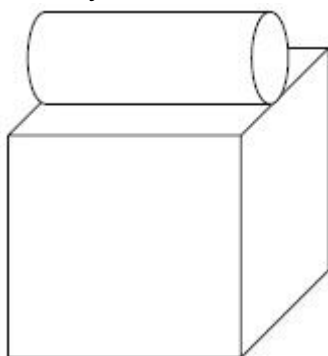


Draw the front elevation on the centimetre grid below.



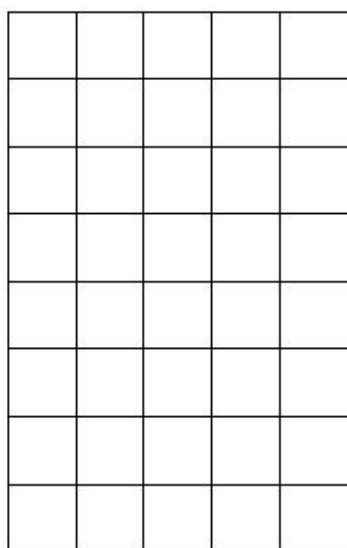
(1)

- (b) The cylinder now sits symmetrically on the centre of the top of the cube as shown.

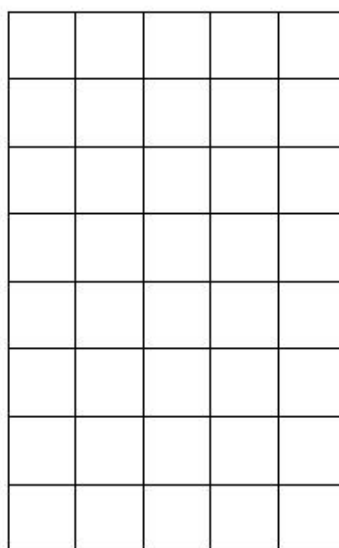


Draw the front elevation and the side elevation on the centimetre grids below.

Front



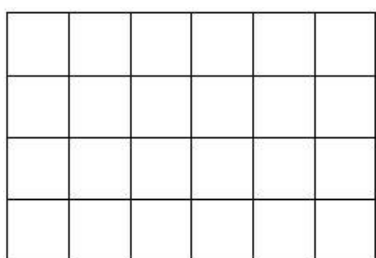
Side



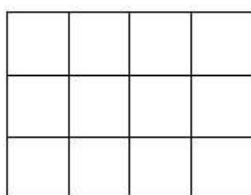
(2)
(Total 3 marks)

Q21.

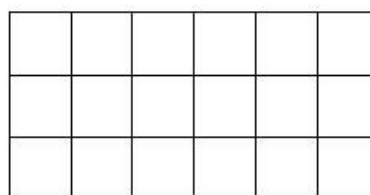
A solid cuboid is made from **centimetre cubes**.



Plan view



Front elevation



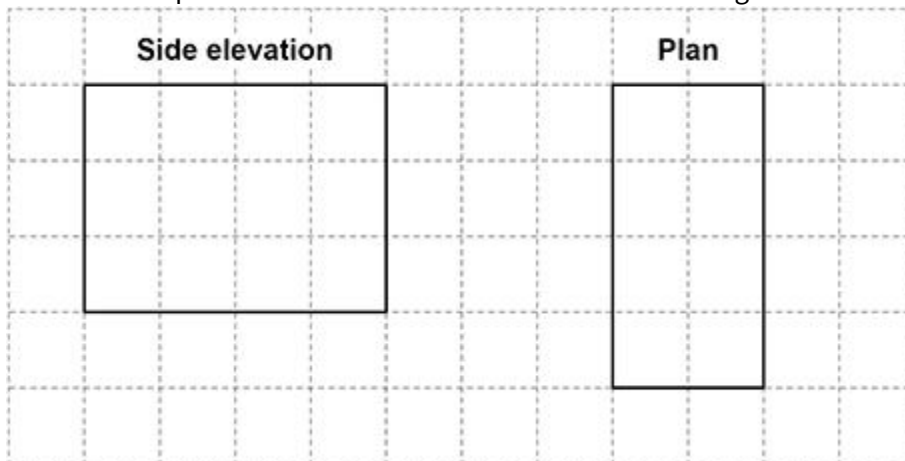
Side elevation

How many centimetre cubes were used to make the cuboid?

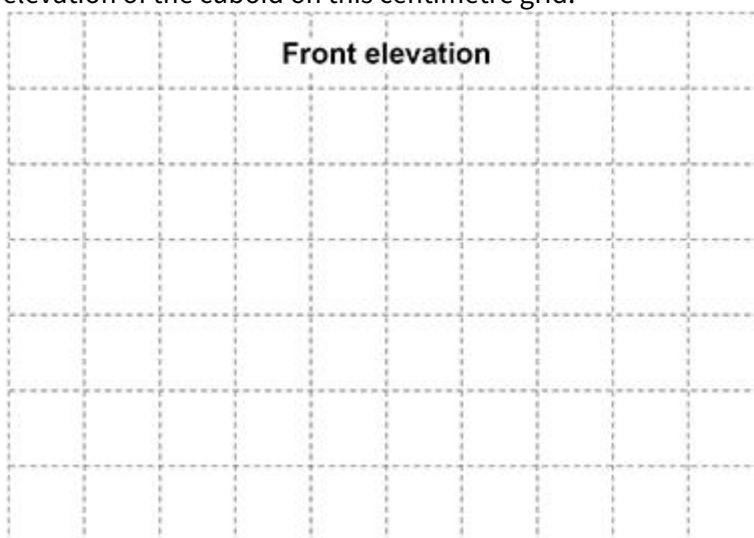
(Total 2 marks)

Q22.

The side elevation and plan of a cuboid are shown on the centimetre grid.



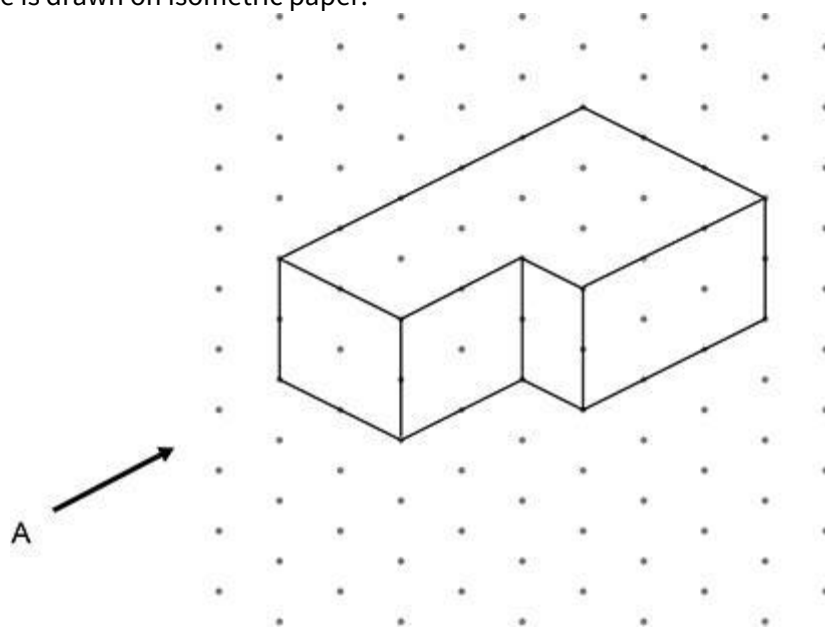
Draw the front elevation of the cuboid on this centimetre grid.



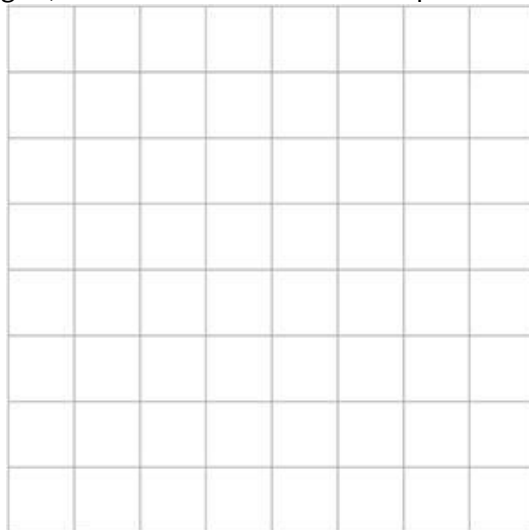
(Total 2 marks)

Q23.

A solid shape is drawn on isometric paper.

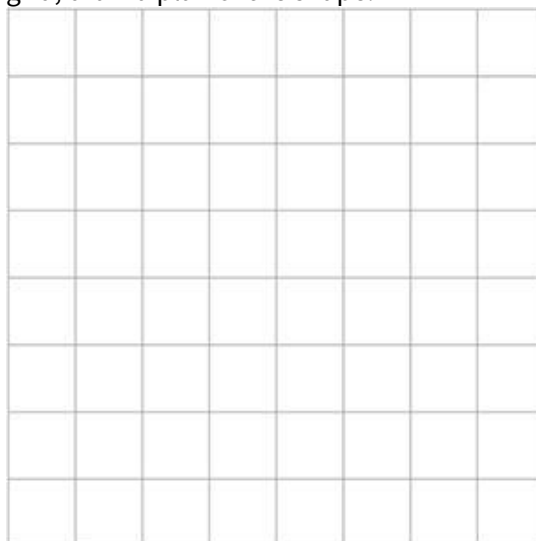


- (a) On the centimetre grid, draw the elevation of the shape from A.



(1)

- (b) On the centimetre grid, draw a plan of the shape.



(1)

(Total 2 marks)

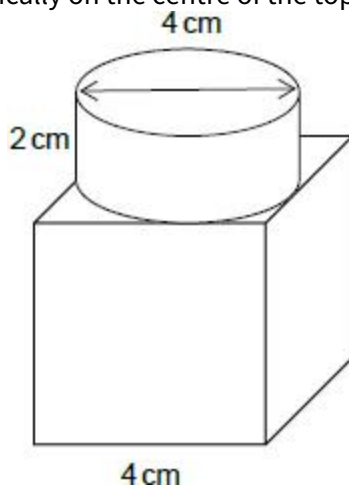
Q24.

A solid shape is made with a cube and a cylinder.

The cube has edge length 4 cm

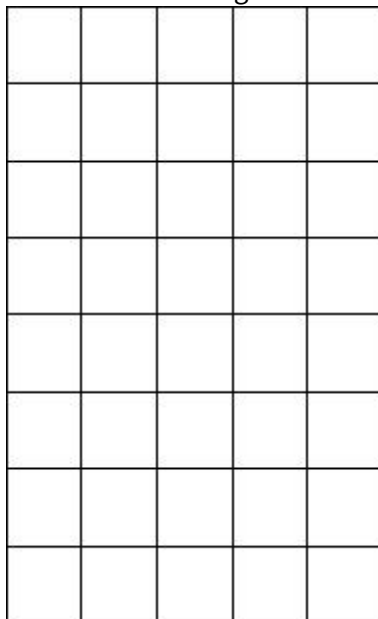
The cylinder has diameter 4 cm and height 2 cm

- (a) The cylinder sits symmetrically on the centre of the top of the cube as shown.



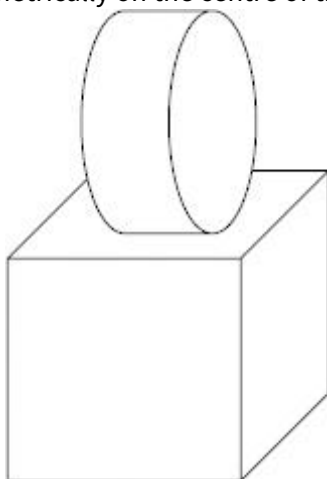
Not drawn accurately

Draw the front elevation on the centimetre grid below.



(1)

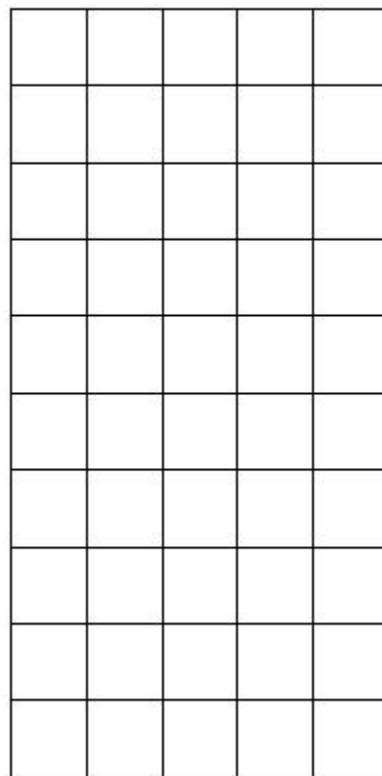
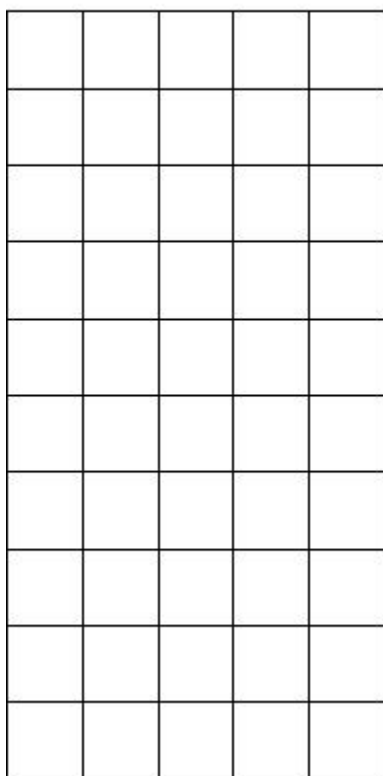
- (b) The cylinder now sits symmetrically on the centre of the top of the cube as shown.



Draw the front elevation and the side elevation on the centimetre grids below.

Front

Side

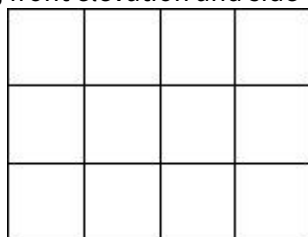


(2)
(Total 3 marks)

Q25.

A solid cuboid is made from **centimetre cubes**.

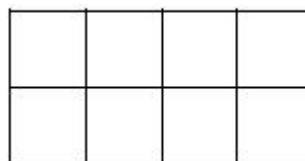
The plan view, front elevation and side elevation are shown.



Plan view



Front elevation



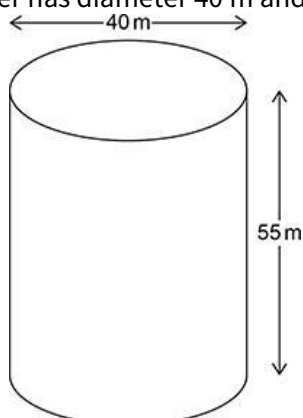
Side elevation

How many cubes were used to make the cuboid?

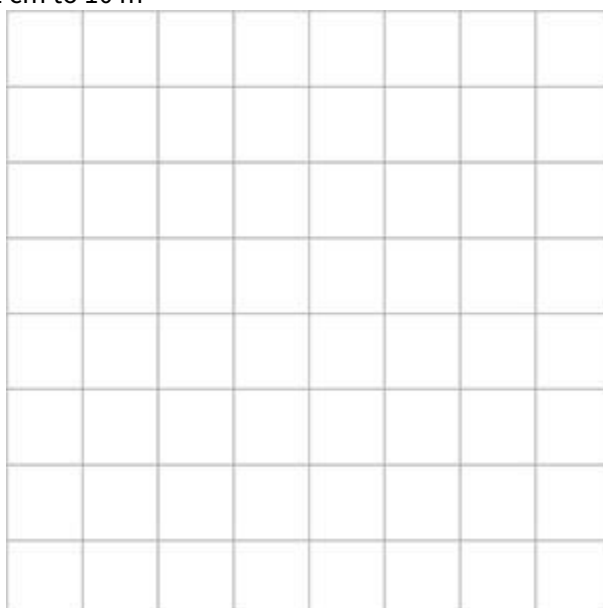
(Total 2 marks)

Q26.

A building in the shape of a cylinder has diameter 40 m and height 55 m



- (a) On the centimetre grid, draw a **plan** of the building.
Use a scale of 1 cm to 10 m



(2)

- (b) On this centimetre grid, draw the **front elevation** of the building.
Use a scale of 1 cm to 10 m

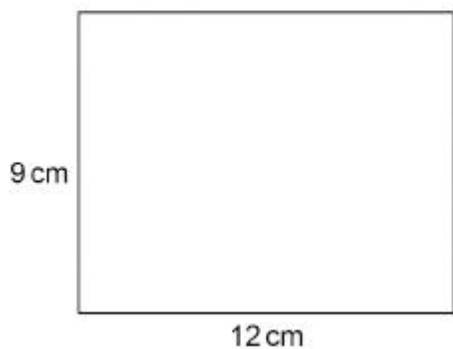


(2)
(Total 4 marks)

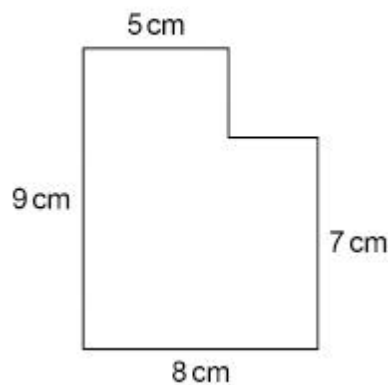
Q27.

A solid shape is made from centimetre cubes.
The front elevation and side elevation of the shape are shown.

Front elevation



Side elevation



Not drawn
accurately

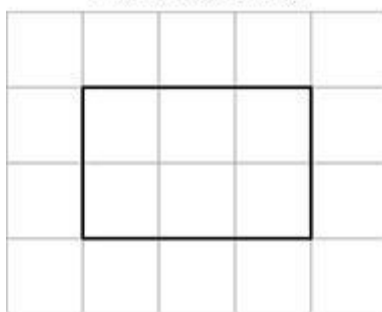
Work out
the **maximum** possible number of cubes in the shape
and
the **minimum** possible number of cubes in the shape.

(Total 3 marks)

Q28.

The front elevation of a cuboid is shown on this centimetre grid.

Front elevation



The volume of the cuboid is 42 cm^3

Draw the **side elevation** on this centimetre grid.

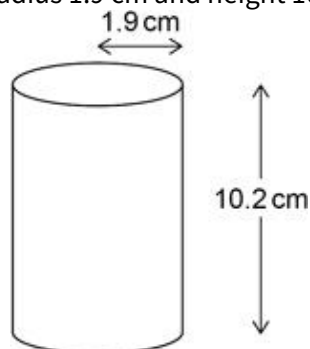
Side elevation



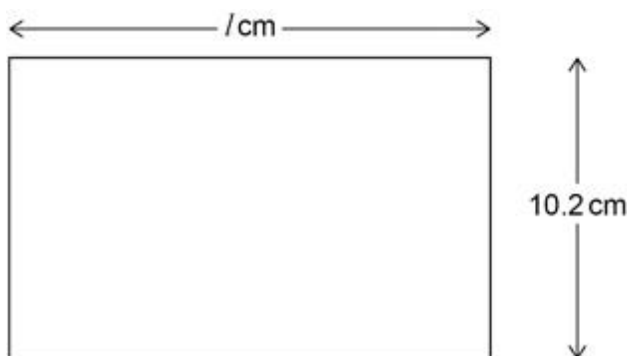
(Total 2 marks)

Q29.

An open cardboard cylinder has radius 1.9 cm and height 10.2 cm



(a) Harry assumes that the net of the cylinder is a rectangle with length $l \text{ cm}$

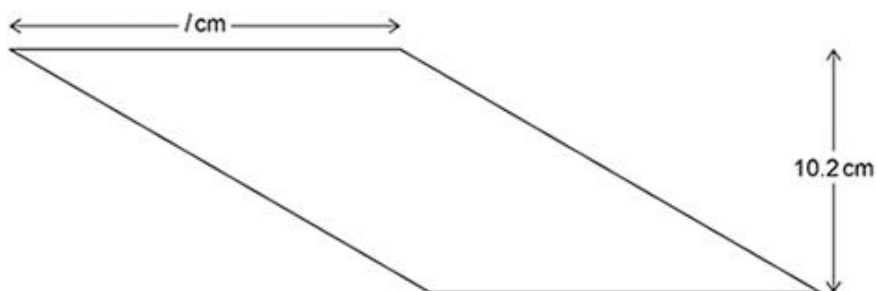


Not drawn accurately

Work out the area of this rectangle.

(3)

In fact, the net is a parallelogram, not a rectangle.



Not drawn accurately

- (b) What does this mean about the **area** of the net?
Tick **one** box.

☐
☐
☐

- It is less than the area of the rectangle
- It is equal to the area of the rectangle
- It is more than the area of the rectangle

(1)

- (c) What does this mean about the **perimeter** of the net?
Tick **one** box.

☐
☐
☐

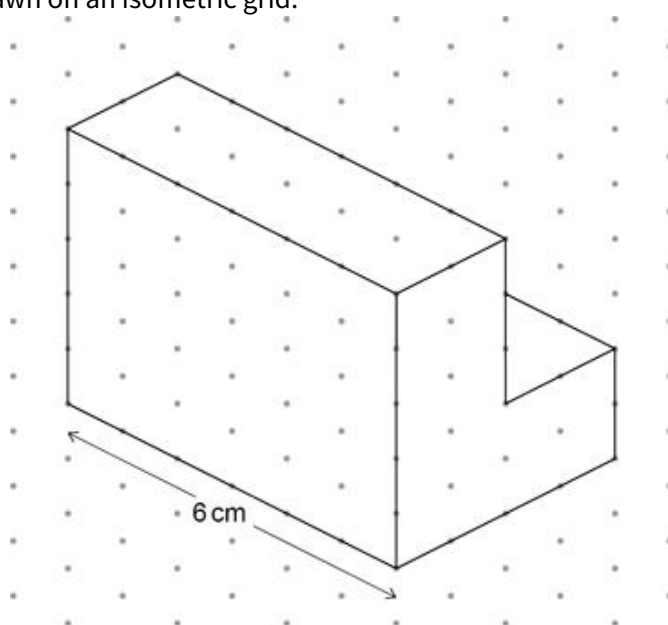
- It is less than the perimeter of the rectangle
- It is equal to the perimeter of the rectangle
- It is more than the perimeter of the rectangle

(1)

(Total 5 marks)

Q30.

Here is a prism drawn on an isometric grid.



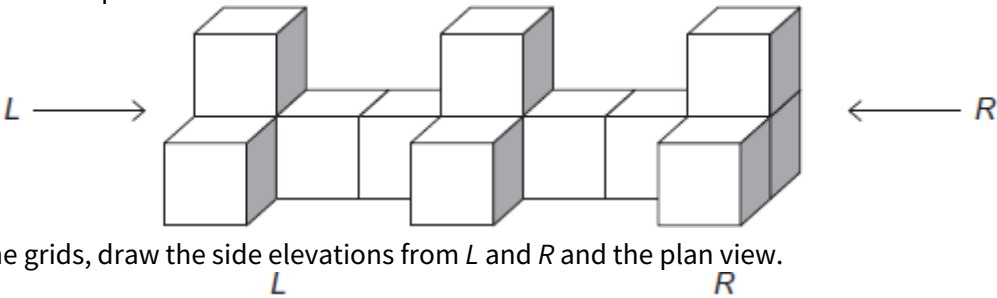
Work out the volume of the prism.

(Total 3 marks)

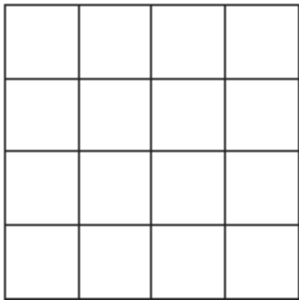
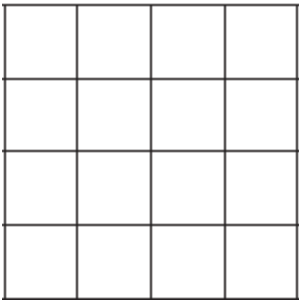
Question 31 is **higher** tier only.

Q31.

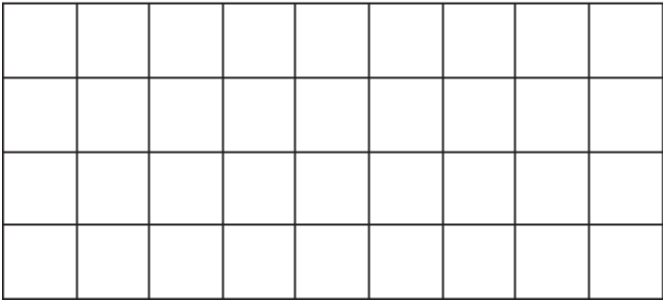
This solid shape is made from identical cubes.



On the grids, draw the side elevations from *L* and *R* and the plan view.



Plan view



(Total 3 marks)