

3D shapes, plans and elevations

Exam questions

Foundation and Higher tiers

Please write clearly in block capitals.

Name

Class

Teacher

Time allowed: 50 minutes

Materials

For this booklet you need a black pen, a pencil, a ruler, a rubber and a calculator for Section B.

Instructions

- Use black ink or black ballpoint pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions in the spaces provided.
- **Section A** (questions 1 to 11): you must not use a calculator.
- **Section B** (questions 12 to 17): you may use a calculator.
- Do all rough work in this booklet. Cross through any work you do not want marked.

For teacher's use

Q	Mark	Q	Mark
1		10	
2		11	
3		12	
4		13	
5		14	
6		15	
7		16	
8		17	
9			
TOTAL			

Information

- The marks for each question are shown in brackets.
- The maximum mark for this booklet is 45.

Advice

- Read each question carefully.
- In all calculations, show clearly how you work out your answer.

Section A



You must not use a calculator

Do not
write
outside
the box

1 Here are the names of six 3D shapes.

cone cube cylinder sphere square-based pyramid
triangular prism

(a) Write down the name of the shape that has exactly one vertex.

Answer _____

[1 mark]

(b) Write down the name of the shape that has five faces and five vertices.

Answer _____

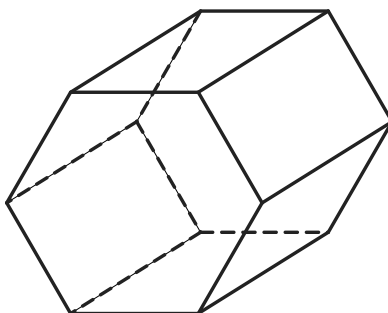
[1 mark]

(c) Write down the name of the shape that has two flat faces and one curved surface.

Answer _____

[1 mark]

2 Here is a hexagonal prism.



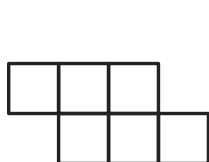
Not drawn accurately

Complete the table for the hexagonal prism.

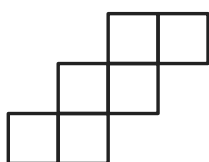
Faces	Edges	Vertices

[2 marks]

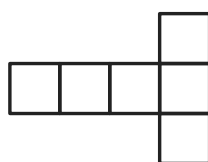
- 3 Here are four nets made from six squares.



A



B



C



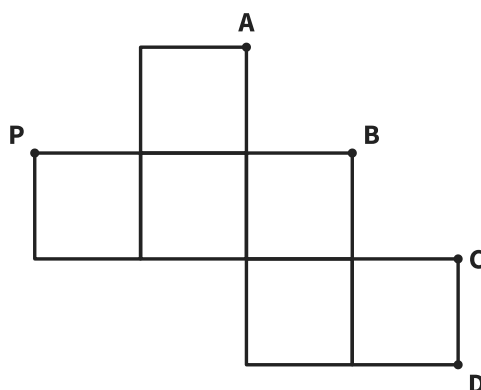
D

Which **two** nets fold to make a cube?

Answer _____

[2 marks]

- 4 The net is folded to make a cube.

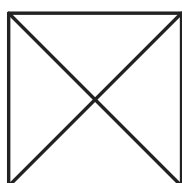


Which of the points A, B, C or D meets point P?

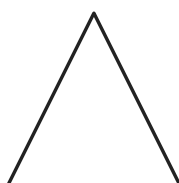
Answer _____

[1 mark]

- 5 Here are the plan, front elevation and side elevation of a solid.



Plan



Front elevation



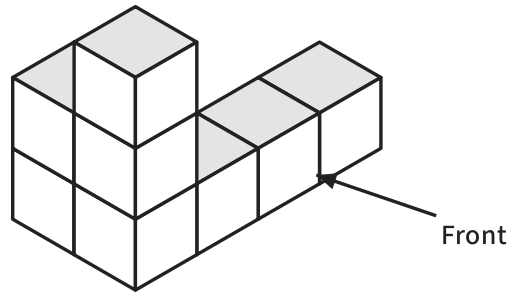
Side elevation

Write down the name of the solid.

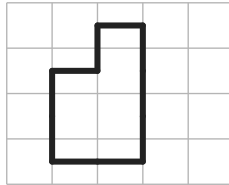
Answer _____

[1 mark]

- 6 The diagram shows a solid made from cubes.



Ella draws this diagram on a grid.



She says it is the front elevation of the solid.

Is Ella correct?

Give a reason for your answer.

[1 mark]

- 7 A pyramid has 10 vertices.

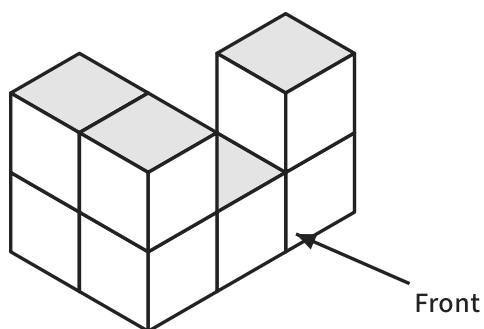
Work out the number of edges of the pyramid.

Answer _____

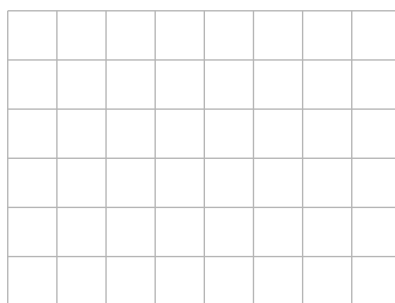
[2 marks]

8

The diagram shows a solid made from 7 cubes.

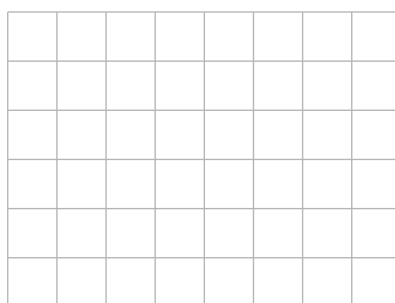


- (a) On the grid, draw the plan of the solid.



[2 marks]

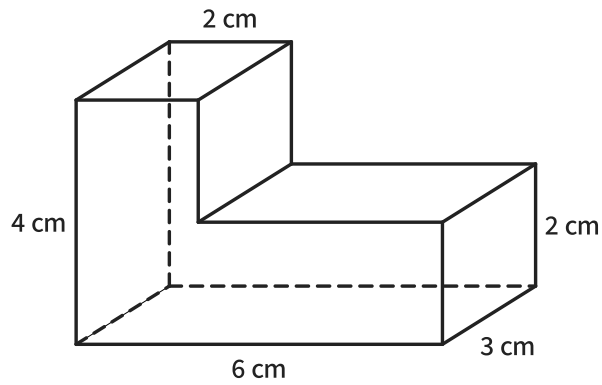
- (b) On the grid, draw the front elevation of the solid.



[2 marks]

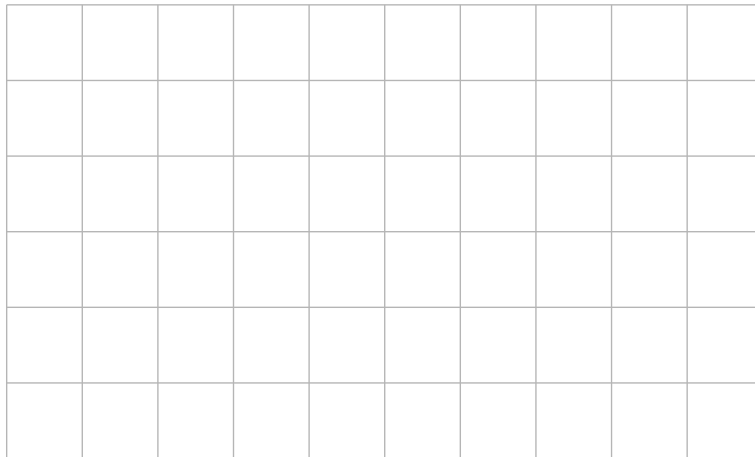
Do not
write
outside
the box

- 9 The diagram shows a prism.



Not drawn accurately

On the centimetre grid, draw the plan of the prism.



[2 marks]

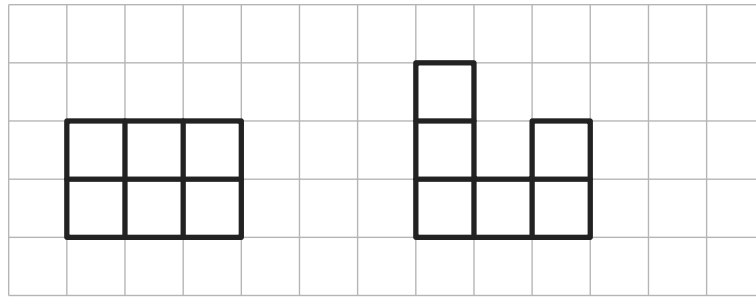
Do not
write
outside
the box

10

A solid is made from centimetre cubes.

Here are the plan and the front elevation of the solid.

The front of the solid is at the bottom of the plan.



Plan

Front elevation

- (a) Work out the greatest number of cubes the solid could have.

Answer _____

[1 mark]

- (b) Work out the least number of cubes the solid could have.

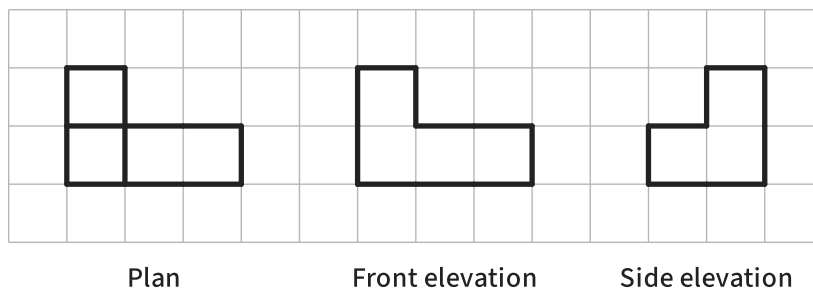
Answer _____

[2 marks]

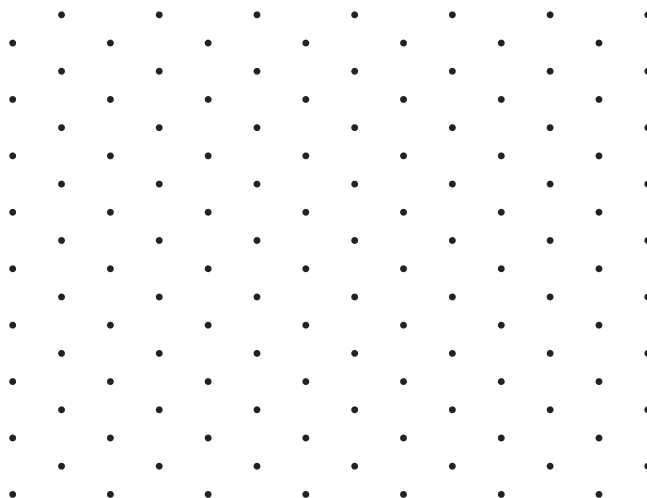
11

Here are the plan, front elevation and side elevation of a solid made from cubes.
 The front of the solid is at the bottom of the plan.
 The side elevation is drawn looking from the left.

Do not
write
outside
the box



On the isometric grid, draw the solid.



[2 marks]

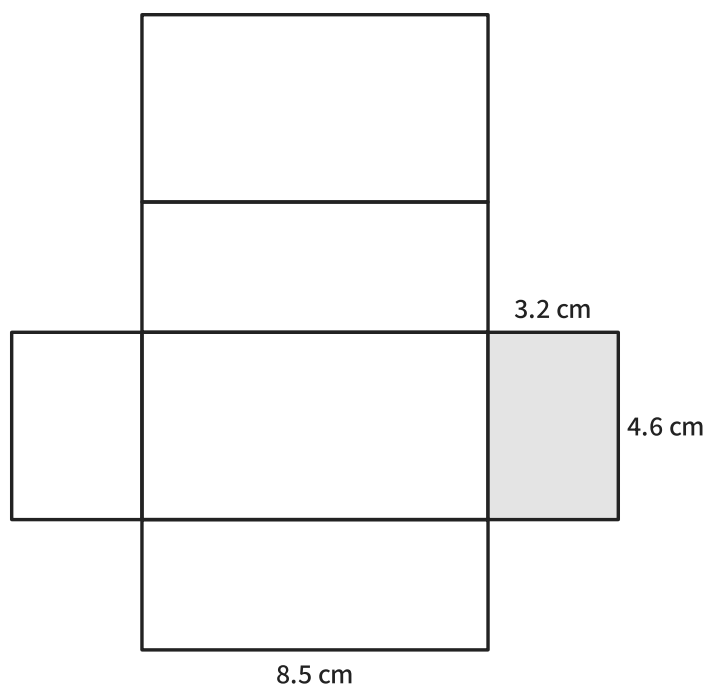
Section B



You may use a calculator

Do not
write
outside
the box

- 12** Here is the net of a cuboid.



Not drawn accurately

- (a)** The net is folded to make the cuboid.
How many vertices does the cuboid have?

Answer _____

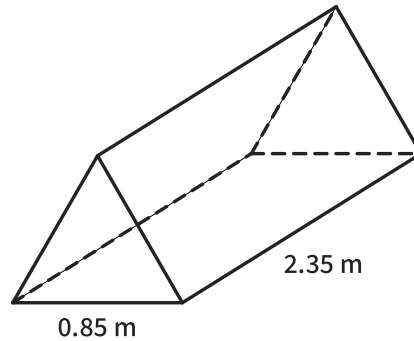
[1 mark]

- (b)** Work out the area of the shaded face.

Answer _____ cm^2 **[2 marks]**

13

A frame for a plant cover is in the shape of a triangular prism.
Each end of the prism is an equilateral triangle with sides of 0.85 m
The prism is 2.35 m long.
The frame has a metal rod along every edge of the prism.
The rod costs £2.79 per metre.



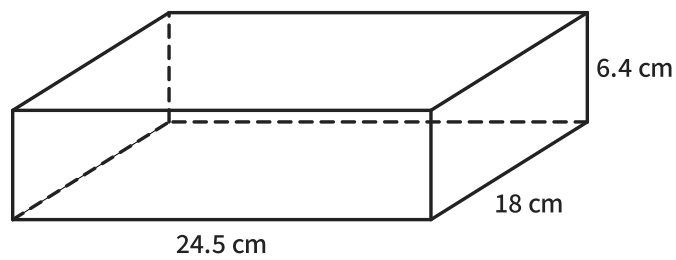
Not drawn accurately

Work out the cost of the rod needed for the frame.

Answer £ _____

[4 marks]

- 14** Mia has a closed box in the shape of a cuboid.
She covers every face of the box with paper.



Not drawn accurately

Work out the total surface area of the box.

Answer _____ cm^2

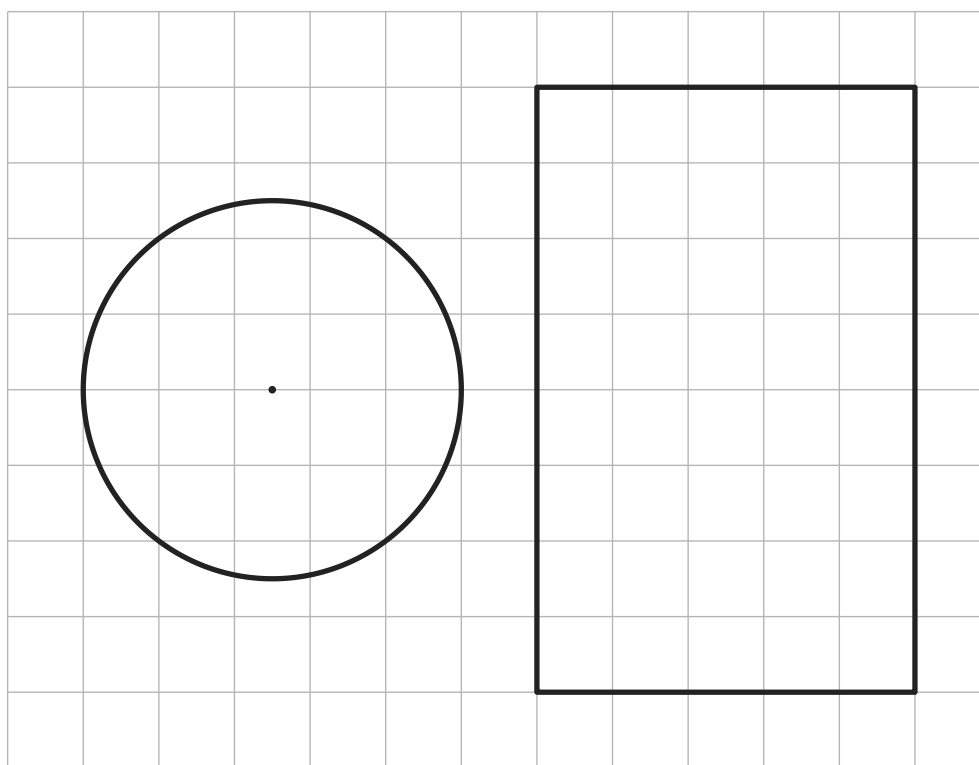
[3 marks]

Do not
write
outside
the box

15

The plan and front elevation of a solid are drawn on a centimetre grid.

Do not
write
outside
the box



Plan

Front elevation

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

Answer _____

[1 mark]

- (b) Work out the volume of the solid.
Give your answer to 1 decimal place.

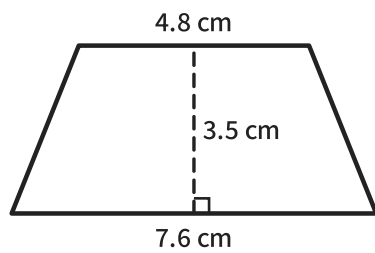
Answer _____ cm^3

[3 marks]

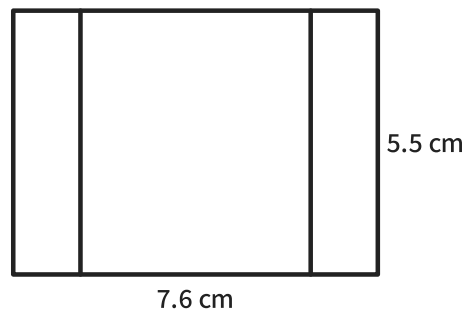
16

Here are the front elevation and the plan of a prism.
The front elevation is an isosceles trapezium.

Do not
write
outside
the box



Front elevation



Plan

Not drawn accurately

Work out the volume of the prism.

Answer _____ cm^3

[4 marks]

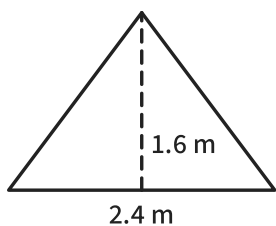
17

A tent is a triangular prism.

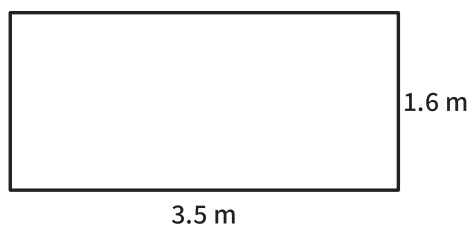
The tent has a groundsheet, so it is closed at the bottom.

Here are the front elevation and the side elevation of the tent.

The front elevation is an isosceles triangle.



Front elevation



Side elevation

Not drawn accurately

Work out the total surface area of the tent.

Answer _____ m^2

[4 marks]

END OF QUESTIONS