

Volume and Surface Area of Prisms and Cylinders

For Pearson Edexcel GCSE Mathematics (1MA1) • Higher tier

Name _____

Total marks: **24**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

- 1** A cylinder has radius 4 cm and height 9 cm.

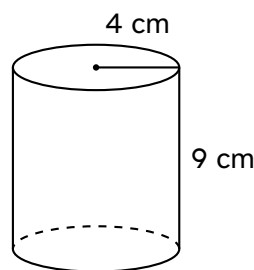


Diagram **NOT** accurately drawn

Work out the volume of the cylinder.
Give your answer correct to 3 significant figures.

..... cm³
(2)

(Total for Question 1 is 2 marks)

- 2 A water trough is a prism.
Its cross section is a trapezium with parallel sides of 40 cm and 30 cm.
The trough is 120 cm long.

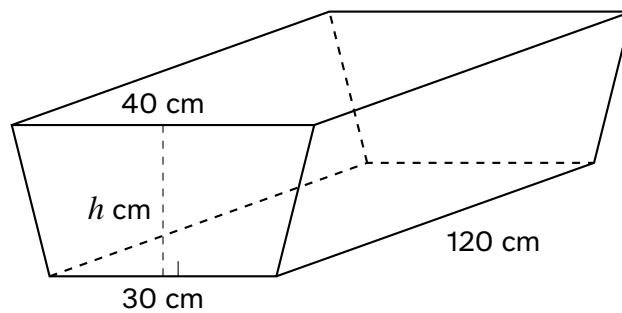


Diagram **NOT** accurately drawn

The trough holds 84 litres of water when it is full.

1 litre = 1000 cm^3

Work out the value of h .

$h = \dots\dots\dots$
(3)

(Total for Question 2 is 3 marks)

- 3 A tin of soup is a cylinder with diameter 7.5 cm and height 11 cm.

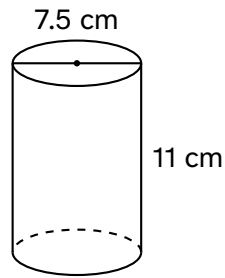


Diagram **NOT** accurately drawn

The label covers the curved surface of the tin.
Work out the area of the label.
Give your answer correct to 3 significant figures.

..... cm^2
(2)

(Total for Question 3 is 2 marks)

- 4 A solid cylinder has radius r cm and height $2r$ cm.
The total surface area is $150\pi \text{ cm}^2$.
Find the volume of the cylinder. Give your answer in terms of π .

..... cm^3
(4)

(Total for Question 4 is 4 marks)

- 5 A swimming pool is a prism. Its cross section is a trapezium. The pool is 25 m long and 10 m wide. The depth is 1 m at the shallow end and 3 m at the deep end.

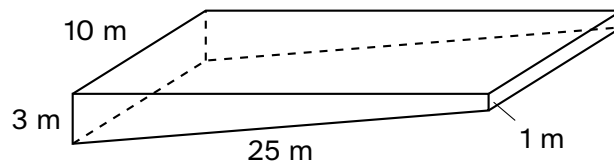


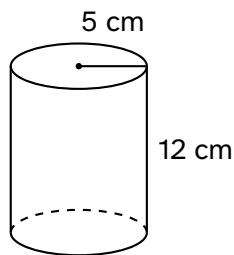
Diagram **NOT** accurately drawn

Water flows into the empty pool at a rate of 0.5 m^3 per minute.
How long will it take to fill the pool? Give your answer in hours, correct to 3 significant figures.

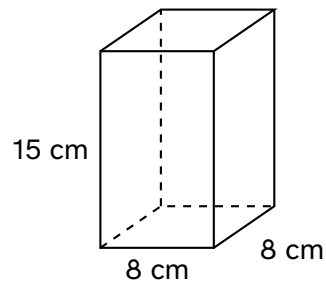
..... hours
(4)

(Total for Question 5 is 4 marks)

- 6** A company is choosing between two designs for a closed tin.
Design A is a cylinder with radius 5 cm and height 12 cm.
Design B is a cuboid with a square base of side 8 cm and a height of 15 cm.



Design A



Design B

*Diagram **NOT** accurately drawn*

The tin must hold at least 900 cm^3 .

The company will choose the design that holds at least 900 cm^3 and uses the smaller area of metal.

Which design should the company choose?

You must show how you get your answer.

(5)

(Total for Question 6 is 5 marks)

- 7 The diagram shows a solid cylinder with radius 3 cm and height h cm.

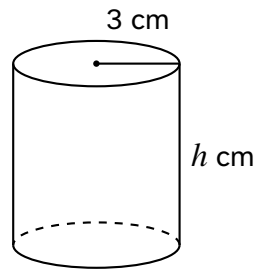


Diagram **NOT** accurately drawn

The cylinder is made from aluminium.
The density of aluminium is 2.7 g/cm^3
The mass of the cylinder is 1 kg.
Work out the height, h cm, of the cylinder.
Give your answer correct to 3 significant figures.

..... cm
(4)

(Total for Question 7 is 4 marks)
