

# 3-D Shapes and Volume

## Question Paper 1

Level	IGCSE
Subject	Maths
Exam Board	Edexcel
Topic	Shape, Space and Measures
Sub Topic	3-D Shapes and volume
Booklet	Question Paper 1

**Time Allowed:** 57 minutes

**Score:** /47

**Percentage:** /100

**Grade Boundaries:**

A*	A	B	C	D	E	U
>85%	75%	70%	60%	55%	50%	<50%

1

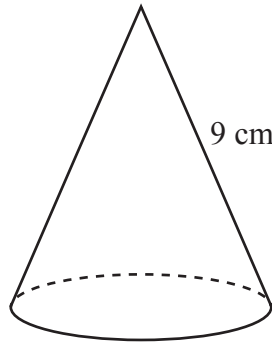


Diagram **NOT**  
accurately drawn

A solid cone has a slant height of 9 cm.  
The **curved** surface area of the cone is  $100 \text{ cm}^2$ .

Calculate the volume of the cone.  
Give your answer correct to 3 significant figures.

.....  $\text{cm}^3$

**(Total for Question 1 is 5 marks)**

2

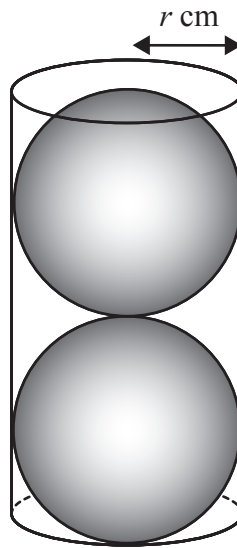


Diagram **NOT** accurately drawn

Two solid spheres, each of radius  $r$  cm, fit exactly inside a hollow cylinder.  
The radius of the cylinder is  $r$  cm.  
The height of the cylinder is equal to  $4r$  cm.

The volume of the space inside the cylinder, not occupied by the spheres, is  $\frac{125}{6} \pi \text{ cm}^3$

Calculate the value of  $r$ .

Show your working clearly.

$r = \dots\dots\dots$

**(Total for Question 2 is 5 marks)**

3

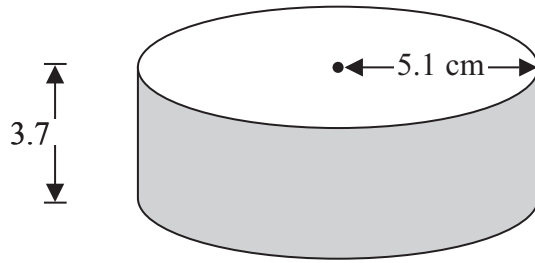


Diagram **NOT** accurately drawn

A solid cylinder has a radius of 5.1cm and a height of 3.7cm

Work out the **total** surface area of the cylinder.  
Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>

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(Total for Question 3 is 3 marks)

4

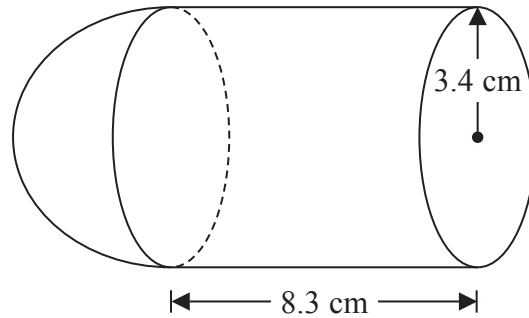


Diagram **NOT** accurately drawn

The diagram shows a shape made from a solid cylinder and a solid hemisphere.  
The cylinder has a radius of 3.4 cm and a length of 8.3 cm.  
The hemisphere has a radius of 3.4 cm.

Calculate the total surface area of the solid shape.  
Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>

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

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5

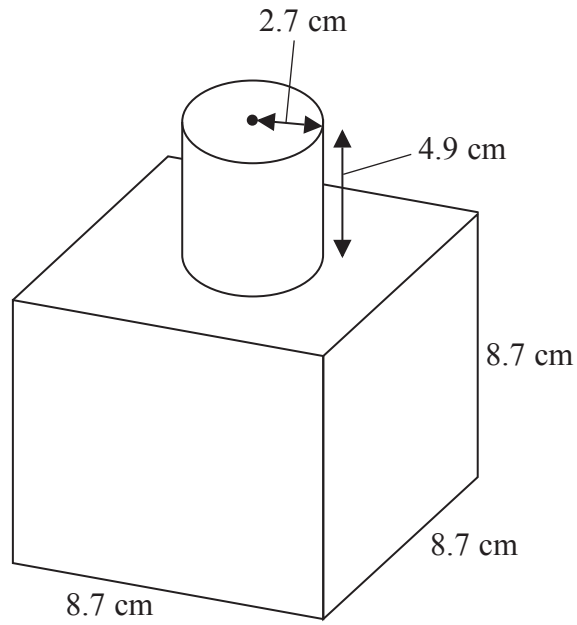


Diagram **NOT** accurately drawn

The diagram shows a shape made from a solid cube and a solid cylinder.

The cube has sides of length 8.7 cm.

The cylinder has a radius of 2.7 cm and a height of 4.9 cm.

Calculate the total surface area of the solid shape.

Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>

(Total for Question 5 is 3 marks)

6

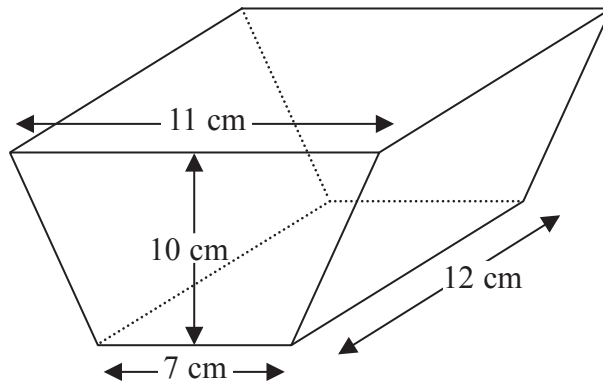


Diagram NOT accurately drawn

The diagram shows a solid prism.  
The cross section of the prism is a trapezium.  
The lengths of the parallel sides of the trapezium are 11 cm and 7 cm.  
The perpendicular distance between the parallel sides of the trapezium is 10 cm.  
The length of the prism is 12 cm.

(a) Work out the area of the trapezium.

..... cm<sup>2</sup>  
(2)

(b) Work out the volume of the prism.

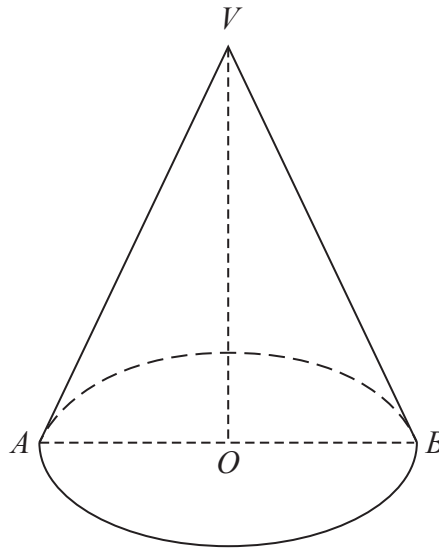
..... cm<sup>3</sup>  
(2)

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(Total for Question 6 is 4 marks)

7

Diagram **NOT**  
accurately drawn



The diagram shows a solid cone.

The base of the cone is a horizontal circle, centre  $O$ , with radius 4.5 cm.

$AB$  is a diameter of the base and  $OV$  is the vertical height of the cone.

The curved surface area of the cone is  $130 \text{ cm}^2$

Calculate the size of the angle  $AVB$ .

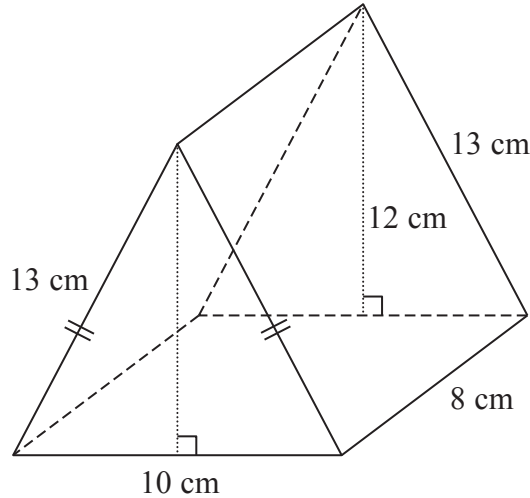
Give your answer correct to 1 decimal place.

.....  
(Total for Question 7 is 4 marks)



8

Diagram **NOT** accurately drawn



The diagram shows a prism.  
The cross-section of the prism is an isosceles triangle.  
The lengths of the sides of the triangle are 13 cm, 13 cm and 10 cm.  
The perpendicular height of the triangle is 12 cm.  
The length of the prism is 8 cm.

Work out the total surface area of the prism.

..... cm<sup>2</sup>

**(Total for Question 8 is 3 marks)**

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9 A trapezium  $ABCD$  has an area of  $5\sqrt{6}\text{ cm}^2$ .

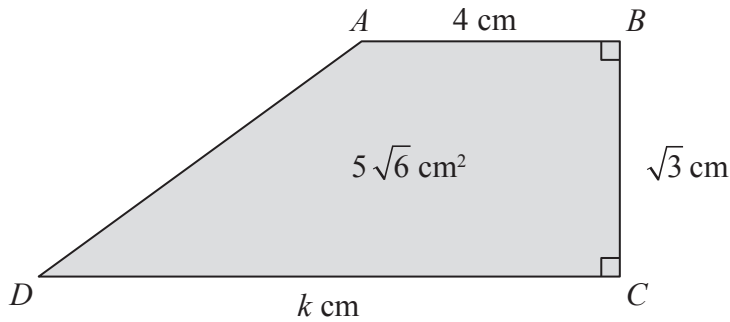


Diagram **NOT** accurately drawn

- $AB = 4\text{ cm}$ .
- $BC = \sqrt{3}\text{ cm}$ .
- $DC = k\text{ cm}$ .

Calculate the value of  $k$ , giving your answer in the form  $a\sqrt{b} - c$  where  $a$ ,  $b$  and  $c$  are positive integers.  
Show each step in your working.

$k = \dots\dots\dots$

**(Total for Question 9 is 3 marks)**

10 A cylinder has diameter 12 cm and length 30 cm.

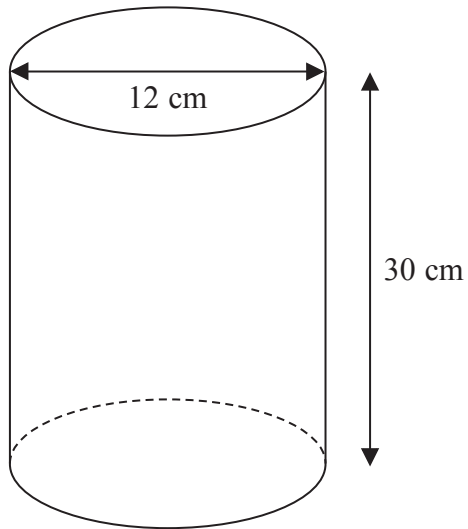


Diagram **NOT** accurately drawn

Work out the curved surface area of the cylinder.  
Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>

(Total for Question 10 is 3 marks)

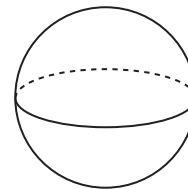
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**11** A sphere has a surface area of  $81\pi \text{ cm}^2$ .

Work out the volume of the sphere.

Give your answer correct to 3 significant figures.



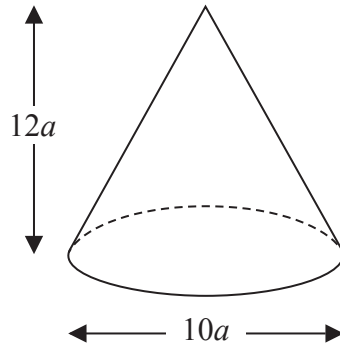
.....  $\text{cm}^3$

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**(Total for Question 11 is 4 marks)**

12 The diagram shows a solid cone.

Diagram **NOT** accurately drawn



The diameter of the base of the cone is  $10a$  cm.

The height of the cone is  $12a$  cm.

The total surface area of the cone is  $360\pi$  cm<sup>2</sup>

The volume of the cone is  $k\pi$  cm<sup>3</sup>, where  $k$  is an integer.

Find the value of  $k$ .

$k = \dots\dots\dots$

(Total for Question 12 is 6 marks)