MME
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GCSE MATHEMATICS

AQA | Edexcel | OCR | WJEC

(Level 5 - 7)

Surface Area of 3D Shapes

Please write clearly in block capitals

Forename:
Surname:

Materials

For this paper you must have:
- mathematical instruments

You ***can*** use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

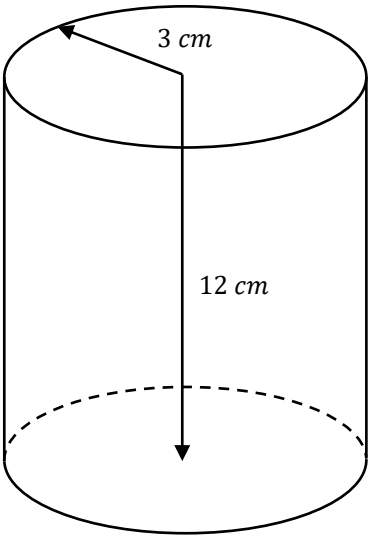
- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

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

1 The diagram below shows a cylinder. *(Level 5)*

The radius of the cylinder is 3 cm and the height is 12 cm.



Not drawn accurately

Find the total surface area of the cylinder shown above.

Give your answer to 2 decimal places.

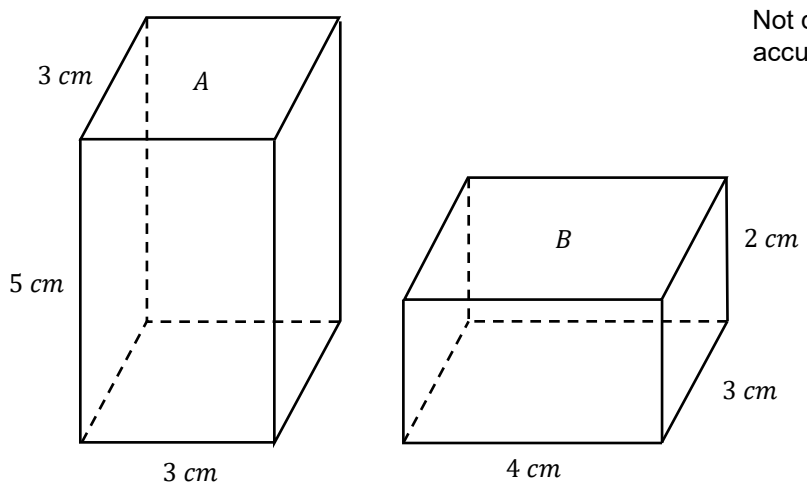
[2 marks]

Answer _____

Turn over for next question

2

2 The diagram below shows two cuboids, A and B. *(Level 5)*



2(a) Find the combined total surface area of cuboids A and B shown above.

[2 marks]

Answer _____

2(b) The two cuboids are attached to each other by placing the entire 3×2 face of cuboid B onto one face of cuboid A.

Calculate the surface area of the new shape.

[2 marks]

Answer _____

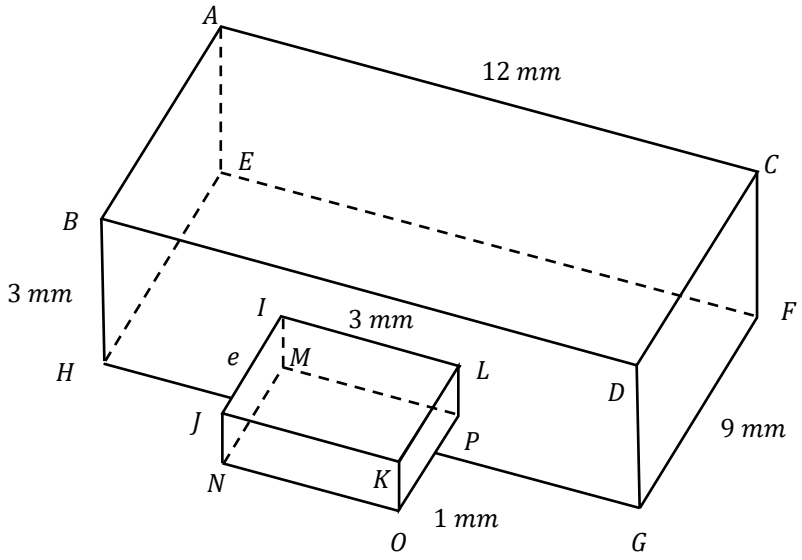
Turn over for next question

4

3 The diagram below shows a representation of a small USB drive consisting of two cuboids, $ABCDEFHG$ and $IJKLMNOP$ attached together. *(Level 6)*

$AG = 12$ mm, $BH = 3$ mm, $GF = 9$ mm

$IL = 3$ mm, $KO = 1$ mm, $IJ = e$



Not drawn accurately

3(a) Find an expression for the total surface area of the USB drive, in terms of e.

[4 marks]

Answer _____

3(b) If the total surface area of the drive is $360\ mm^2$.

Calculate the value of e

[1 mark]

Answer _____ mm

Turn over for next question

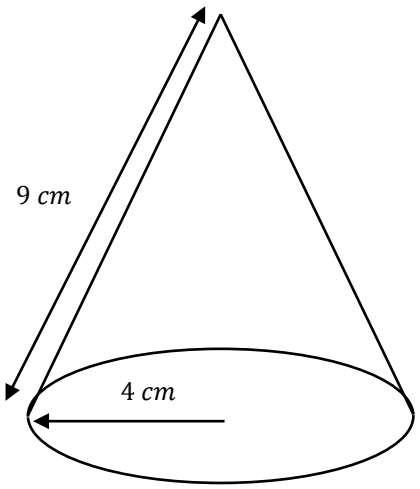
5

4 The diagram below shows a cone. *(Level 6)*

The radius of the cone is 4 cm and the slanted height is 9 cm.

Use the equations: Surface area = $\pi rl + \pi r^2$

Not drawn accurately



Calculate the total surface area of the cone.

Give your answer to 2 decimal places

[3 marks]

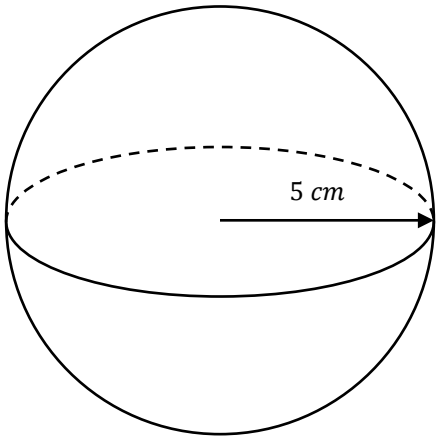
Answer _____

Turn over for next question

3

5 The diagram below shows a sphere. *(Level 6)*

The radius of the sphere is 5 cm.



Not drawn accurately

Using the equation, $A = 4\pi r^2$,calculate the surface area of the sphere.

Give your answer to 2 decimal places.

[2 marks]

Answer _____

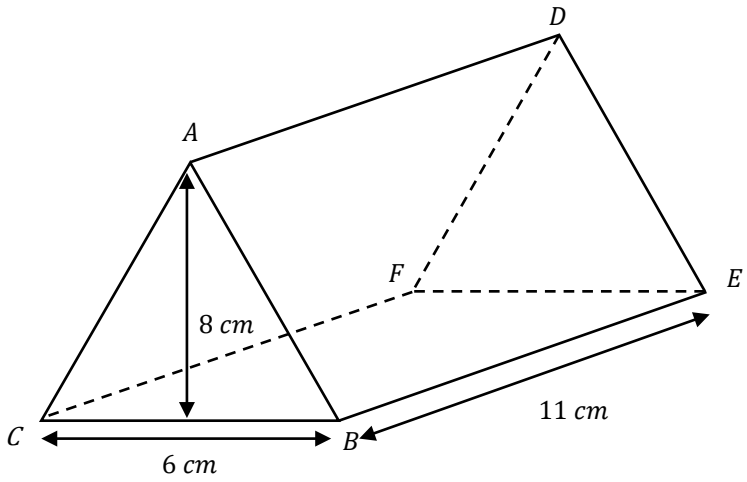
2

6 The diagram below shows a triangular prism $ABCDEF$ *(Level 6)*

$CB = 6$ cm

$BE = 11$ cm

The vertical height = 8 cm



Calculate the surface area of the triangular prism.

Give your answer to 2 decimal places

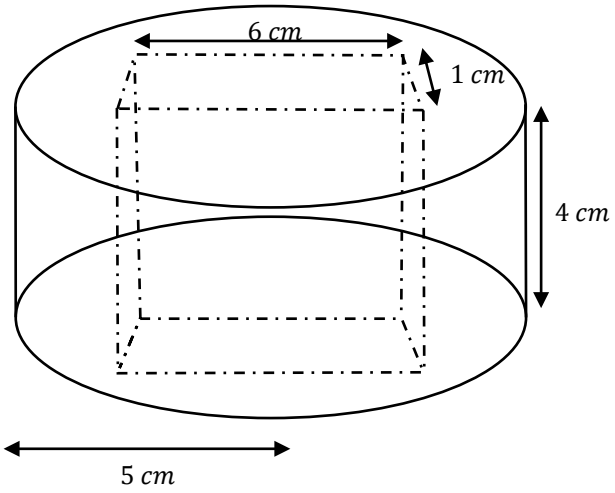
[4 marks]

Answer _____

4

7 A shape is made from a cylinder of radius 5 cm and height 4 cm. *(Level 7)*

A cuboid measuring 6 cm wide, 1 cm long and 4 cm deep is cut out of the center as shown below.



Not drawn accurately

7(a) Calculate the total surface area of the cylinder before the cuboid was removed.

Give your answer in terms of π

[2 marks]

Answer _____ cm^2

7(b) Calculate the surface area of the new shape formed by removing the cuboid.

Give your answer as a decimal to 2 decimal places.

[2 marks]

Answer _____ cm^2

4

END