

Name: _____

GCSE (1 – 9)

Surface Area

Instructions

- Use **black** ink or ball-point pen.
- Answer all Questions.
- Answer the Questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

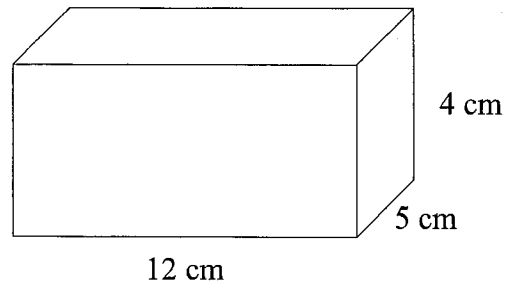
- The marks for each Question are shown in brackets
– *use this as a guide as to how much time to spend on each Question.*

Advice

- Read each Question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every Question.
- Check your answers if you have time at the end

1 The diagram shows a cuboid..

Find the total surface area of the cuboid.



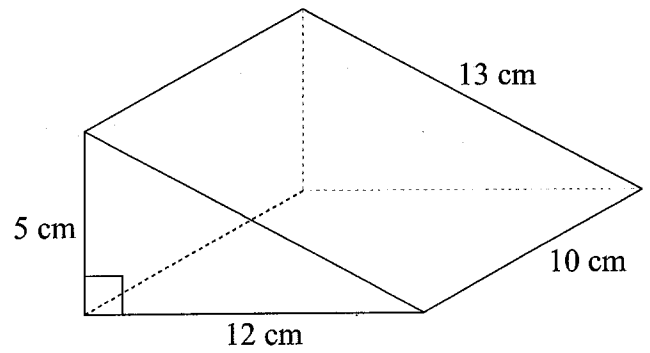
Front	$12 \times 4 = 48 \text{ cm}^2$
Back	48 cm^2
Top	$12 \times 5 = 60 \text{ cm}^2$
Bottom	60 cm^2
Side	$5 \times 4 = 20 \text{ cm}^2$
Side	20 cm^2

48
48
60
60
20
20
<hr/>
256

.....
 256 cm^2

(Total for question 1 is 3 marks)

- 2 The diagram shows a triangular prism.
Find the total surface area of the triangular prism.



$$\begin{aligned} \text{Front} &= \frac{1}{2} \times 12 \times 5 = 30 \text{ cm}^2 \\ \text{Back} &= 30 \text{ cm}^2 \\ \text{Bottom} &= 12 \times 10 = 120 \text{ cm}^2 \\ \text{Side} &= 5 \times 10 = 50 \text{ cm}^2 \\ \text{Top} &= 13 \times 10 = 130 \text{ cm}^2 \end{aligned}$$

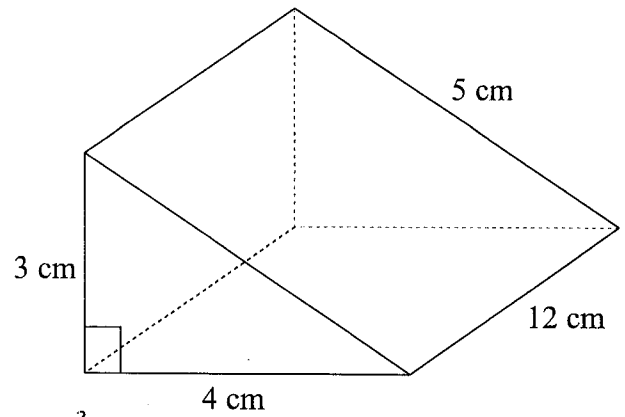
$$\begin{array}{r} 130 \\ 120 \\ 50 \\ 30 \\ 30 \\ \hline 360 \end{array}$$

$$\underline{\underline{360 \text{ cm}^2}}$$

(Total for question 2 is 3 marks)

3 The diagram shows a triangular prism.

Find the total surface area of the triangular prism.



$$\text{Front} = \frac{1}{2} \times 4 \times 3 = 6 \text{ cm}^2$$

$$\text{Back} = 6 \text{ cm}^2$$

$$\text{Bottom} = 4 \times 12 = 48 \text{ cm}^2$$

$$\text{Side} = 3 \times 12 = 36 \text{ cm}^2$$

$$\text{Top} = 5 \times 12 = 60 \text{ cm}^2$$

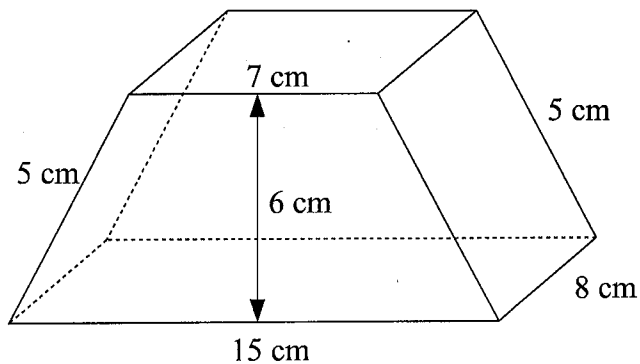
$$\begin{array}{r} 60 \\ 48 \\ 36 \\ 6 \\ 6 \\ \hline 156 \end{array}$$

..... 156 cm^2

(Total for question 3 is 3 marks)

- 4 The diagram shows a prism.
The cross section of the prism is in the shape of a trapezium.

Calculate the total surface area of the prism.



$$\begin{aligned}
 \text{Front} &= \frac{1}{2}(7 + 15) \times 6 = 66 \text{ cm}^2 \\
 \text{Back} &= 66 \text{ cm}^2 \\
 \text{Side} &= 5 \times 8 = 40 \text{ cm}^2 \\
 \text{Side} &= 40 \text{ cm}^2 \\
 \text{Top} &= 7 \times 8 = 56 \text{ cm}^2 \\
 \text{Bottom} &= 8 \times 15 = 120 \text{ cm}^2
 \end{aligned}$$

$$\begin{array}{r}
 1 \ 2 \ 0 \\
 6 \ 6 \\
 6 \ 6 \\
 5 \ 6 \\
 4 \ 0 \\
 4 \ 0 \\
 \hline
 2 \ 1 \\
 3 \ 8 \ 8
 \end{array}$$

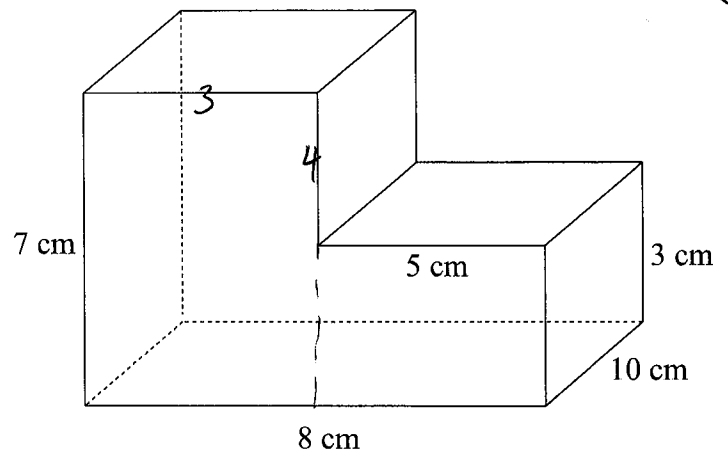
$$\text{.....} 388 \text{ cm}^2 \text{.....}$$

(Total for question 4 is 4 marks)

5

The diagram shows a prism.

Calculate the total surface area of the prism.



$$\text{Front} = 3 \times 7 + 5 \times 3 = 36 \text{ cm}^2$$

$$\text{Back} = 36 \text{ cm}^2$$

$$\text{Bottom} = 8 \times 10 = 80 \text{ cm}^2$$

$$\text{Total Top} = 80 \text{ cm}^2$$

$$\text{Side} = 7 \times 10 = 70 \text{ cm}^2$$

$$\text{Total Side} = 70 \text{ cm}^2$$

$$\begin{array}{r} 80 \\ 80 \\ 70 \\ 70 \\ 36 \\ 36 \\ \hline 372 \end{array}$$

$$\dots\dots\dots 372 \text{ cm}^2$$

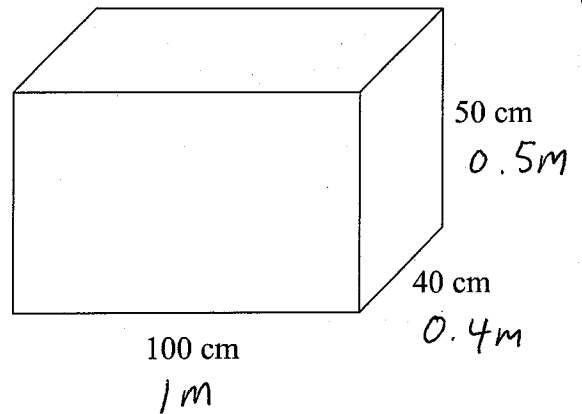
(Total for question 5 is 4 marks)

6 The diagram shows a box.

5 of these boxes are going to be painted.

Each pot of paint can cover 6m^2 .

How many pots of paint are needed to paint the 5 boxes?



$$\text{Front} = 1 \times 0.5 = 0.5 \text{ m}^2$$

$$\text{Back} = \quad \quad \quad = 0.5 \text{ m}^2$$

$$\text{Side} = 0.4 \times 0.5 = 0.2 \text{ m}^2$$

$$\text{Side} \quad \quad \quad = 0.2 \text{ m}^2$$

$$\text{Top} = 1 \times 0.4 = 0.4 \text{ m}^2$$

$$\text{Bottom} = \quad \quad \quad = 0.4 \text{ m}^2$$

$$\begin{array}{r} 0.5 \\ 0.5 \\ 0.4 \\ 0.4 \\ 0.2 \\ 0.2 \\ \hline 2.2 \end{array}$$

$$2.2 \text{ m}^2 \times 5 = \underline{\underline{11 \text{ m}^2}} \text{ in total}$$

$$1 \text{ pot} = 6 \text{ m}^2$$

$$2 \text{ pots} = 12 \text{ m}^2$$

.....2.....pots

(Total for question 6 is 4 marks)

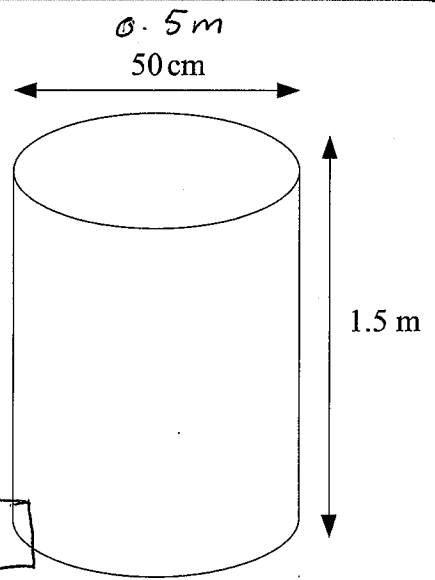
7

The diagram shows a cylindrical tank.
The tank has a top and a bottom.

4 of these tanks are going to be painted.
Each tank has a diameter of 50 cm and a height of 1.5 m.

Each pot of paint can cover 4 m^2 .

How many pots of paint are needed to paint the 4 tanks?



$$\text{Surface area} = \text{circle} + \text{circle} + \text{rectangle}$$

$$\begin{aligned} \text{Top} &= \pi r^2 = \pi (0.25)^2 \\ &= \frac{\pi}{16} \text{ OR } 0.1963495\dots \end{aligned}$$

$$\text{Radius} = 0.25 \text{ m}$$

$$\text{Bottom} = \frac{\pi}{16} \text{ OR } 0.1963495\dots$$

$$\begin{aligned} \text{Curved area} &= \text{circumference} \times 1.5 \\ &= \pi (0.5) \times 1.5 \\ &= \frac{3}{4} \pi \text{ OR } 2.35619\dots \end{aligned}$$

$$\begin{aligned} \text{Total surface area} &= \frac{1}{16} \pi + \frac{1}{16} \pi + \frac{3}{4} \pi \\ &= \frac{7}{8} \pi \text{ OR } 2.74889 \text{ m}^2 \end{aligned}$$

$$2.74889\dots \times 4 = \underline{10.99 \text{ m}^2} \quad [\text{surface area of 4 tanks}]$$

$$\frac{10.99}{4} = 2.74889 \quad \underline{3 \text{ pots needed}}$$

.....3.....pots

(Total for question 7 is 4 marks)