Volume and Surface Area of Cuboids
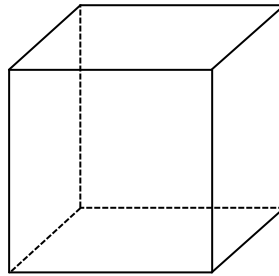
REVISE THIS TOPIC

1 Here is a cube.

3 cm

(a) Work out the volume of the cube.

$$3 \times 3 \times 3$$

....................**27**....................cm^3

(2)

(b) Work out the surface area of the cube.

$$3 \times 3 = 9 \text{ cm}^2$$

$$9 \times 6 = 54 \text{ cm}^2$$

....................**54**....................cm^2

(2)

(Total for Question 1 is 4 marks)

1

2 Here is a cuboid.

3 cm

2 cm

6 cm
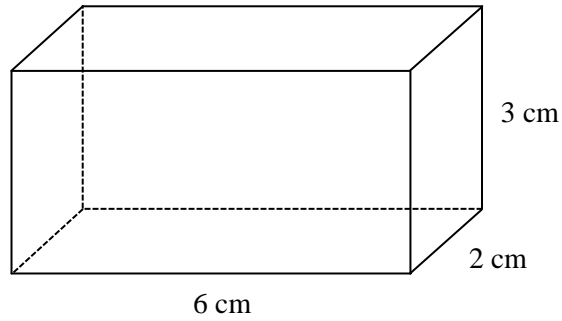
(a) Work out the volume of the cuboid.

$$6 \times 2 \times 3$$

................................**36**................................ cm³

(2)

(b) Work out the surface area of the cuboid.

$$6 \times 2 = 12$$
$$6 \times 3 = 18$$
$$2 \times 3 = \underline{6}$$
$$36$$

$$36 \times 2 = 72$$

................................**72**................................ cm²

(3)

(Total for Question 2 is 5 marks)

3 Here is a cuboid.

4 cm

6 cm

15 cm
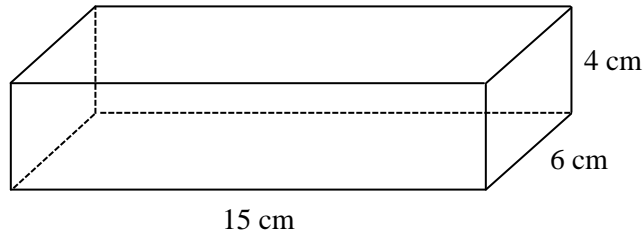
(a) Work out the volume of the cuboid.

$15 \times 6 \times 4$

360

....cm³

(2)

(b) Work out the surface area of the cuboid.

$15 \times 6 = 90$
$15 \times 4 = 60$
$6 \times 4 = \underline{24}$
$\overline{174}$

174×2

348

....cm²

(3)

(Total for Question 3 is 5 marks)

3

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4 Here is a cuboid.

2.5 m

5 m

4 m
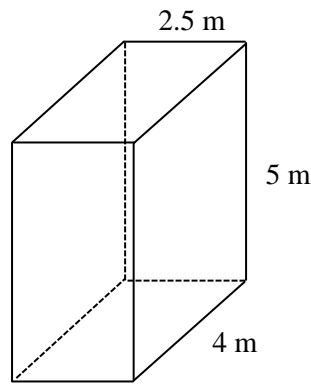
(a) Work out the volume of the cuboid.

$4 \times 5 \times 2.5$

50 ....m^3

(2)

(b) Work out the surface area of the cuboid.

$4 \times 5 = 20$ $32.5 \times 2 = 65$
$4 \times 2.5 = 10$
$5 \times 2.5 = \underline{12.5}$
$ 32.5$

65 ....m^2

(3)

(Total for Question 4 is 5 marks)

1st

4

5 Here are three cuboids.

Cuboid A **Cuboid B** **Cuboid C**

3 cm
3 cm
5 cm

11 cm
2 cm
2 cm

1.6 cm
5 cm
6 cm
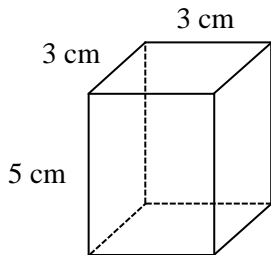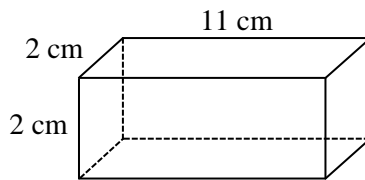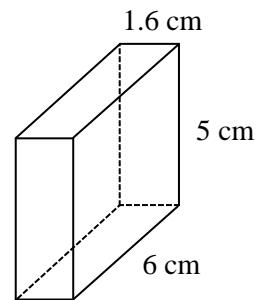
Work out the cuboid that has the greatest volume.
You must show your working.

$$A: \quad 3 \times 3 \times 5 = 45 \, cm^3$$
$$B: \quad 2 \times 2 \times 11 = 44 \, cm^3$$
$$C: \quad 6 \times 5 \times 1.6 = 48 \, cm^3$$

C

....

(Total for Question 5 is 5 marks)

1st

5

6 Here is a small cuboid and a large cuboid.

25 cm

20 cm

20 cm

2 m

2 m

5 m
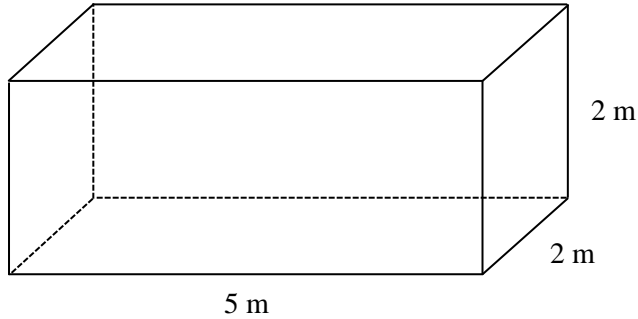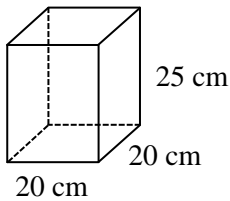
Work out how many of the smaller cuboids could fit into the larger cuboid.

$20 \times 20 \times 25 = 10000 \text{ cm}^3$

$500 \times 200 \times 200 = 20000000 \text{ cm}^3$

$20\,000\,000 \div 10000 = 2000$

OR

$500 \div 20 = 25$

$200 \div 20 = 10$

$200 \div 25 = 8$

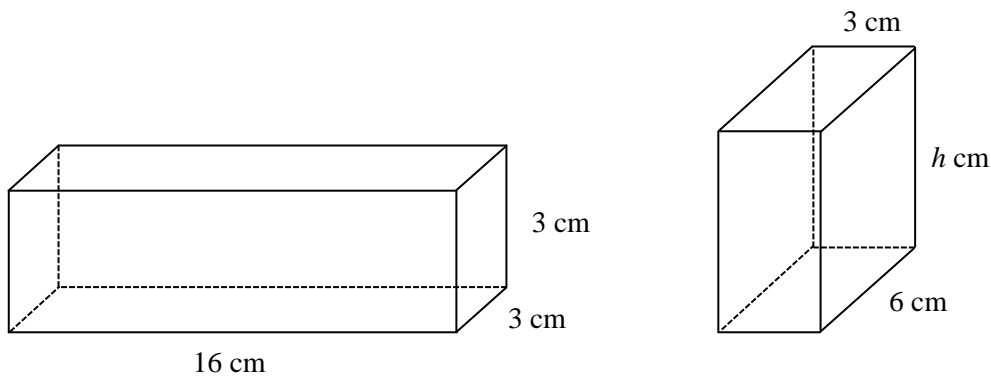$25 \times 10 \times 8$

$= 2000$

2000

(Total for Question 6 is 4 marks)

1st

6

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7 Here are two cuboids with the same volume.

3 cm

h cm

6 cm

3 cm

3 cm

16 cm

Work out the value of h.

$16 \times 3 \times 3 = 144 \text{ cm}^3$

$6 \times 3 = 18$

$144 \div 18 = 8$

$h =$ **8**

(Total for Question 7 is 4 marks)

8 Here is a cuboid.

6.5 cm

6.4 cm

15cm
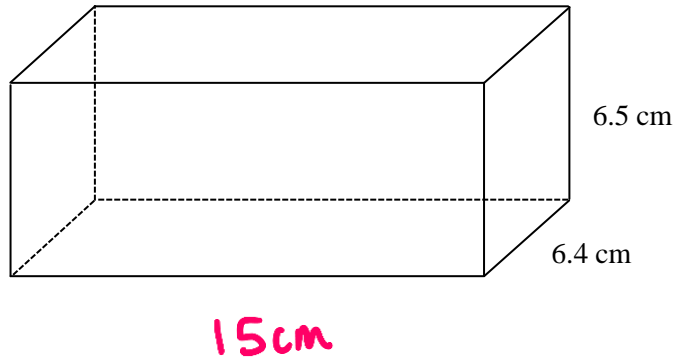
The volume of the cuboid is 624 cm³

Work out the surface area of the cuboid.

$6.4 \times 6.5 = 41.6$
$624 \div 41.6 = 15$

$6.4 \times 6.5 = 41.6$ 235.1×2
$6.4 \times 15 = 96$ $= 470.2$
$6.5 \times 15 = \underline{97.5}$
                        235.1

470.2 .... cm²
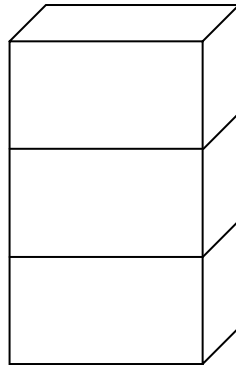
(Total for Question 8 is 4 marks)

8

9 Here is a cuboid.

The identical copies of the cuboid are stacked together to make a larger cuboid.

For each statement below, tick one box.

	True	False
The height of the new cuboid is 3 times the height of the original cuboid.	✓	
The volume of the new cuboid is 3 times the volume of the original cuboid.	✓	
The surface area of the new cuboid is 3 times the surface area of the original cuboid.		✓

(Total for Question 9 is 3 marks)

9

10 A cuboid is placed onto a flat surface so that the bottom face is no longer visible.

1.2 m

1 m

0.8 m
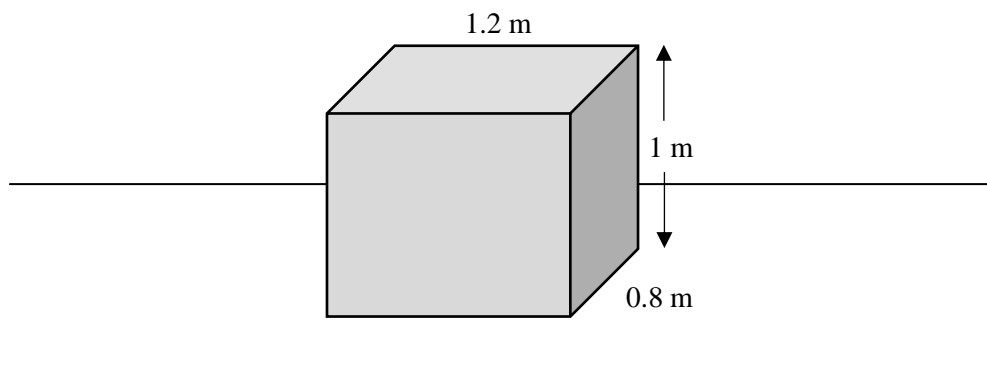
The five visible faces of the cuboid are to be painted.
Each tin of paint can cover an area of 1 m² and costs £3.50

Work out how much it would cost to buy enough tins of paint to paint the five visible faces of the cuboid.

$1 \times 0.8 = 0.8$
$1 \times 1.2 = 1.2$
$1.2 \times 0.8 = 0.96$

$(2 \times 0.8) + (2 \times 1.2) + (1 \times 0.96)$
$= 4.96 \text{m}^2$

need 5 tins $5 \times 3.50 = £17.50$

£ ....**17·50**.......

(Total for Question 10 is 5 marks)

1st

10

11 A cube has a volume of 1000 cm^3

Work out the surface area of the cube.

$$\sqrt[3]{1000} = 10$$

$$10 \times 10 \times 6 = 600$$

..........**600**.......... cm^2

(Total for Question 11 is 3 marks)

12 A cube has a surface area of 54 cm^2

Work out the volume of the cube.
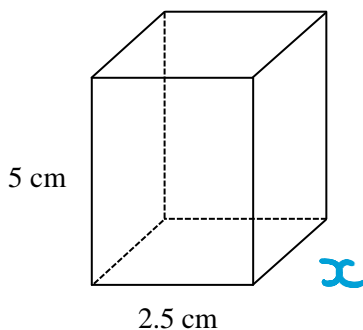
$$54 \div 6 = 9$$

$$\sqrt{9} = 3$$

$$3 \times 3 \times 3$$

..........**27**.......... cm^3

(Total for Question 12 is 4 marks)

1st

11

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13 Here is a cuboid.

5 cm

x

2.5 cm

The surface area of the cuboid is 61 cm²

Work out the volume of the cuboid.

$5 \times 2.5 = 12.5$
$12.5 \times 2 = 25$
$61 - 25 = 36$

$2.5 \times x \times 2 = 5x$
$5 \times x \times 2 = 10x$
$10x + 5x = 15x$

$15x = 36$
$x = \dfrac{36}{15}$
$x = 2.4$

$5 \times 2.5 \times 2.4$
$= 30$

30 cm³

(Total for Question 13 is 5 marks)

1st

12