4.2 Geometry: Area, Perimeter and Volume: 2-hour Pack

Calculator allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A square has a perimeter of 24 m. Work out its area.

Diagram NOT accurately drawn

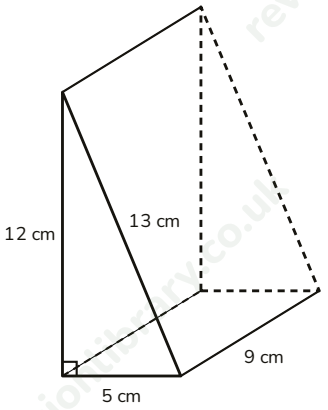


(2)

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2 A triangular prism has a right-angled triangle as its cross-section. The triangle has sides 5 cm, 12 cm and 13 cm (the longest side is 13 cm). The prism is 9 cm long. Work out the total surface area.

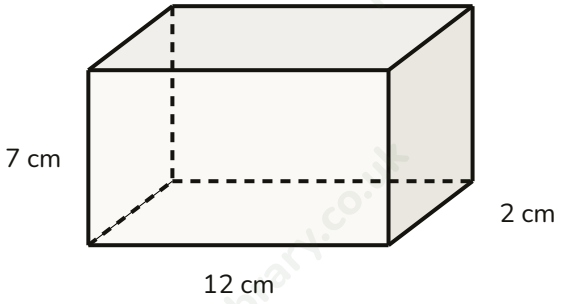
Diagram NOT accurately drawn



(4)

3 A cuboid measures 12 cm by 2 cm by 7 cm. Work out its total surface area.

Diagram NOT accurately drawn

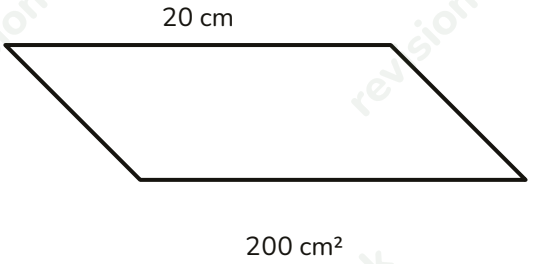


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4 A parallelogram has area 200 cm² and base 20 cm. Work out the perpendicular height.

Diagram NOT accurately drawn



(2)

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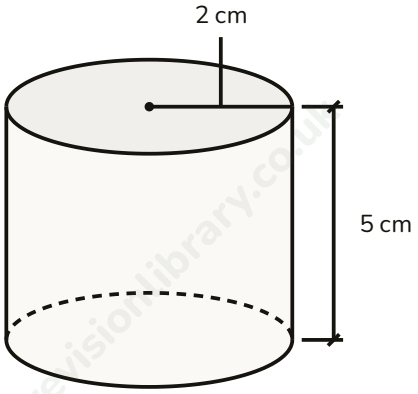
5 The perimeter of a rectangle is 46 mm and its length is 18 mm. Work out its area.

(3)

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6 A cylinder has radius 2 cm and height 5 cm. Work out its volume in terms of π.

Diagram NOT accurately drawn

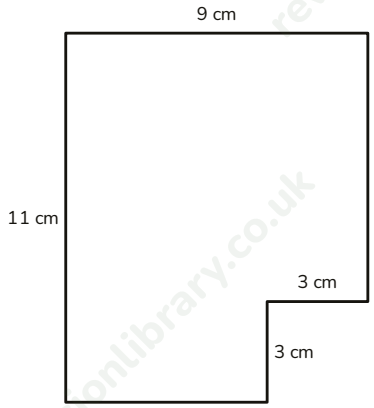


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7 An L-shape is made by taking a 9 cm by 11 cm rectangle and cutting a 3 cm by 3 cm rectangle out of one corner.
Work out the area of the L-shape.

Diagram NOT accurately drawn

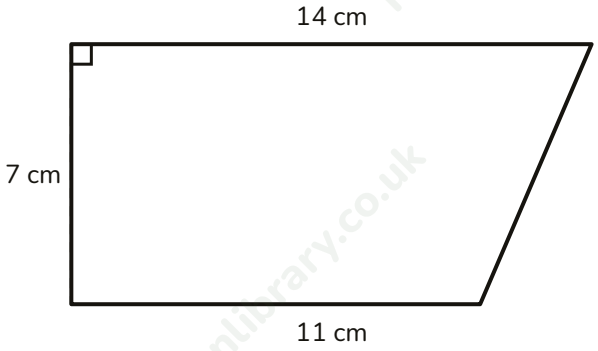


(3)

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8 A trapezium has parallel sides of 11 cm and 14 cm. The distance between the parallel sides is 7 cm. Work out the area of the trapezium.

Diagram NOT accurately drawn

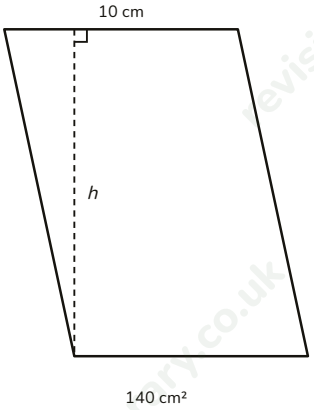


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9 A parallelogram has area 140 cm² and base 10 cm. Work out the perpendicular height.

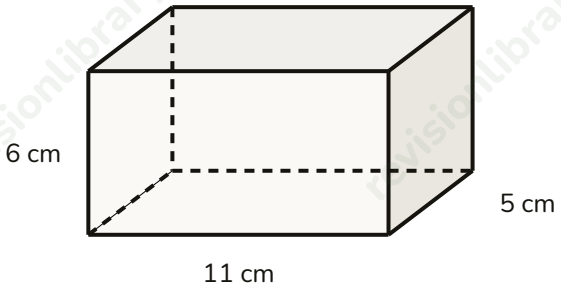
Diagram NOT accurately drawn



(2)

10 A cuboid measures 11 cm by 5 cm by 6 cm. Work out its total surface area.

Diagram NOT accurately drawn

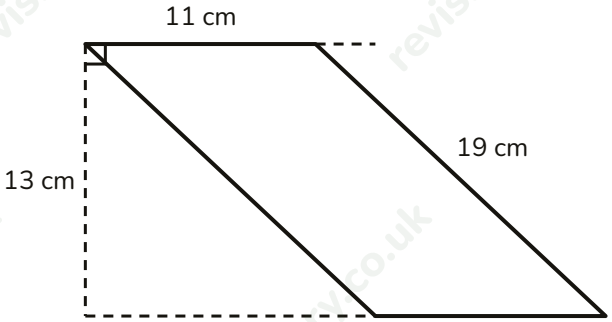


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11 A parallelogram has base 11 cm, a slanting side of 19 cm and a perpendicular height of 13 cm. Work out its area.

Diagram NOT accurately drawn

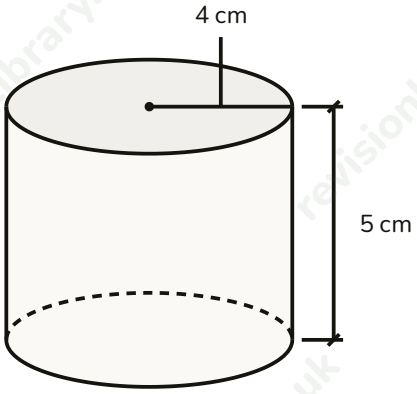


(2)

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12 A cylinder has radius 4 cm and height 5 cm. Work out its volume in terms of π.

Diagram NOT accurately drawn

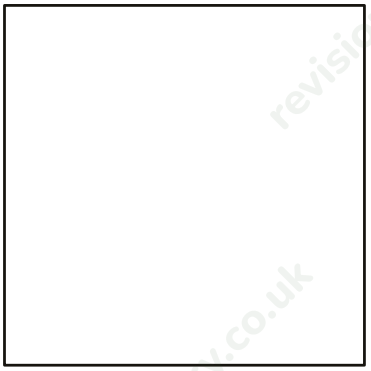


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13 A square has a perimeter of 32 cm. Work out its area.

Diagram NOT accurately drawn



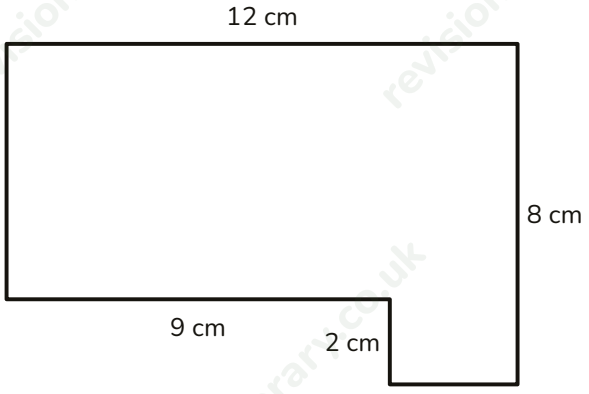
Perimeter = 32 cm

(2)

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14 An L-shape is made by taking a 8 cm by 12 cm rectangle and cutting a 2 cm by 9 cm rectangle out of one corner.
Work out the area of the L-shape.

Diagram NOT accurately drawn

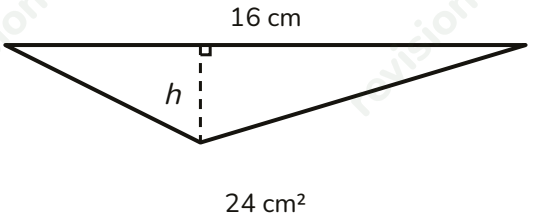


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15 A triangle has area 24 cm² and a base of 16 cm. Work out its perpendicular height.

Diagram NOT accurately drawn

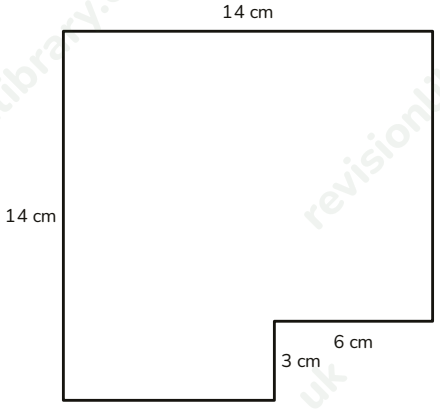


(3)

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16 An L-shape is made by taking a 14 cm by 14 cm rectangle and cutting a 6 cm by 3 cm rectangle out of one corner.
Work out the area of the L-shape.

Diagram NOT accurately drawn

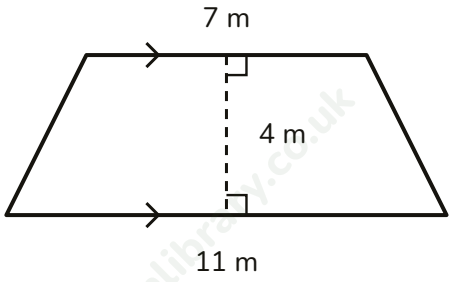


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17 A trapezium-shaped flower bed has parallel sides of length 7 m and 11 m, and a perpendicular height of 4 m between them. Calculate the area of the flower bed.

Diagram NOT accurately drawn

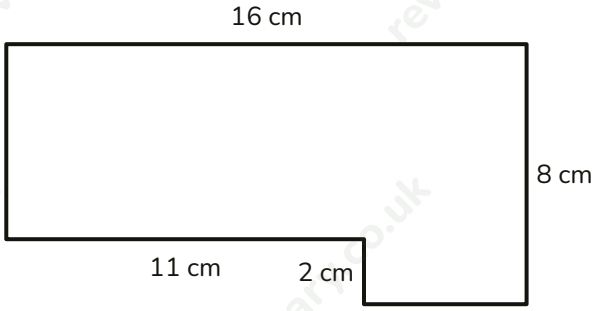


(2)

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18 An L-shape is made by taking a 16 cm by 8 cm rectangle and cutting a 11 cm by 2 cm rectangle out of one corner.
Work out the area of the L-shape.

Diagram NOT accurately drawn

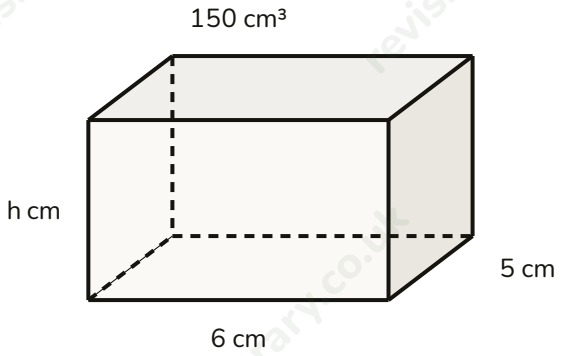


(3)

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19 A cuboid has volume 150 cm³. Its length is 6 cm and its width is 5 cm. Work out its height.

Diagram NOT accurately drawn



(3)

20 Give your answers to 3 significant figures.

(a) A circular pond has a radius of 6 m. Calculate its circumference. **(2)**

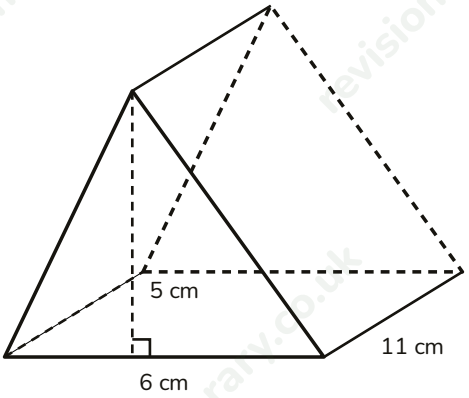
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(b) A circular tabletop has a diameter of 15 cm. Calculate its circumference. **(2)**

.....

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21 A prism has a triangular cross-section with base 6 cm and perpendicular height 5 cm. The length of the prism is 11 cm. Calculate the volume of the prism.



(3)

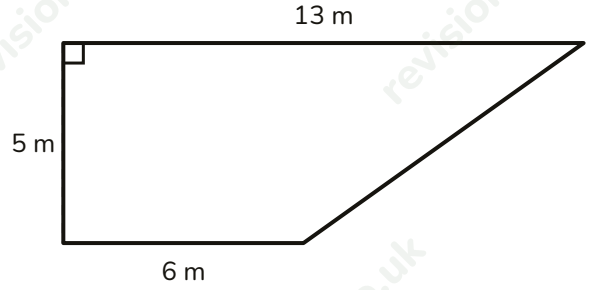
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22 A rectangular room measures 5 m by 3.6 m. New carpet costs £21.75 per m^2. Calculate the total cost of carpeting the room.

(3)

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23 A trapezium-shaped flower bed has parallel sides of length 6 m and 13 m, and a perpendicular height of 5 m between them. Calculate the area of the flower bed.



(2)

24 A circular pond has a radius of 7 m. Calculate its circumference, giving your answer to 3 significant figures.

(2)

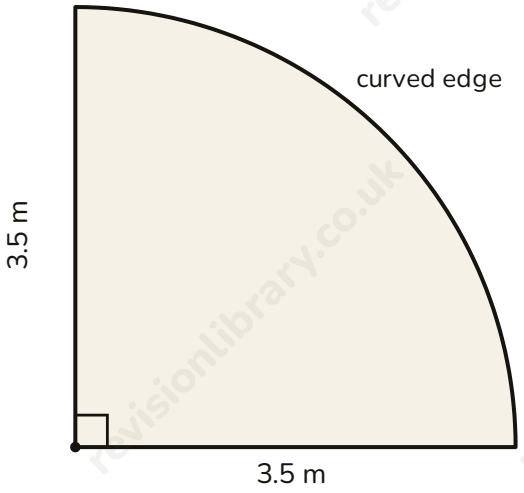
25 A circular tabletop has a diameter of 18 cm. Calculate its circumference, giving your answer to 3 significant figures.

(2)

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26 A quarter-circle flower bed has a radius of 3.5 m (a sector with angle 90 degrees). Give your answers to 3 significant figures.

Diagram NOT accurately drawn



(a) Calculate the arc length of the flower bed's curved edge. **(2)**

.....

(b) Calculate the area of the flower bed. **(2)**

.....

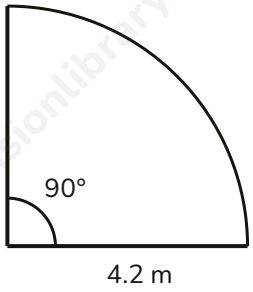
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27 A rectangular patio measures 12 m by 5 m. It is covered with a uniform layer of gravel 0.15 m deep. Calculate the volume of gravel needed.

(2)

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28 A flower bed is in the shape of a quarter circle (a sector with angle 90 degrees) of radius 4.2 m. Give your answers to 3 significant figures.



(a) Calculate the arc length of the flower bed's curved edge. **(2)**

.....

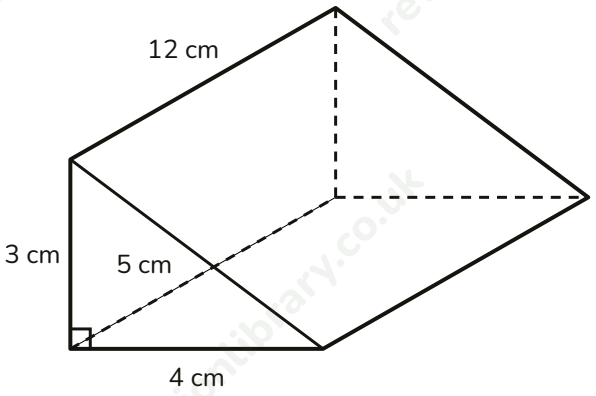
(b) Calculate the area of the flower bed. **(2)**

.....

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29 A prism has a right-angled triangular cross-section with the two shorter sides measuring 3 cm and 4 cm (hypotenuse 5 cm). The length of the prism is 12 cm. Calculate the total surface area of the prism.

Diagram NOT accurately drawn



(4)

30 A wall measures 5 m long and 2.8 m high. It contains one rectangular window measuring 1.4 m by 1.2 m and one rectangular door measuring 0.8 m by 2 m. One litre of paint covers 10 m². Paint is sold only in 2-litre tins.

(a) Calculate the area of the wall that needs to be painted (the wall area minus the window and the door). **(2)**

(b) Calculate the minimum number of 2-litre tins of paint needed. Show your working. **(2)**

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Mark scheme · 4.2 Geometry: Area, Perimeter and Volume: 2-hour Pack

Question 1

24 ÷ 4 = 6	M1
36 m² cao	A1

Answer: **36 m^2**

Question 2

two triangles: 2 x 1/2 x 5 x 12 = 60	M1
perimeter of triangle x length: 30 x 9	M1
adds the triangles and the rectangles	M1
330 cm² cao	A1

Answer: **330 cm^2**

Question 3

area of at least two different faces found	M1
all three pairs of faces: 2(24) + 2(84) + 2(14)	M1
244 cm² cao	A1

Answer: **244 cm^2**

Question 4

200 ÷ 20	M1
10 cm cao	A1

Answer: **10 cm**

Question 5

18 + w = 23 (half the perimeter)	M1
w = 5 and 18 x 5	M1
90 mm² cao	A1

Answer: **90 mm^2**

Question 6

π x 2^2	M1
x 5	M1
20 π cm^3 cao	A1

Answer: **20 π cm^3**

Question 7

9 x 11 = 99	M1
3 x 3 = 9	M1
90 cm² cao	A1

Answer: **90 cm^2**

Question 8

11 + 14 = 25	M1
1/2 x 25 x 7	M1
87.5 cm² cao	A1

Answer: **87.5 cm^2**

Question 9

140 ÷ 10	M1
14 cm cao	A1

Answer: **14 cm**

Question 10

area of at least two different faces found	M1
all three pairs of faces: 2(55) + 2(66) + 2(30)	M1
302 cm² cao	A1

Answer: **302 cm^2**

Question 11

11 x 13	M1
143 cm² cao	A1

Answer: **143 cm^2**

Question 12

π x 4^2	M1
x 5	M1
80 π cm^3 cao	A1

Answer: **80 π cm^3**

Question 13

32 ÷ 4 = 8	M1
64 cm² cao	A1

Answer: **64 cm^2**

Question 14

8 x 12 = 96	M1
2 x 9 = 18	M1
78 cm² cao	A1

Answer: **78 cm^2**

Question 15

24 = 1/2 x 16 x h or 24 x 2	M1
48 ÷ 16	M1
3 cm cao	A1

Answer: **3 cm**

Question 16

14 x 14 = 196	M1
6 x 3 = 18	M1
178 cm² cao	A1

Answer: **178 cm^2**

Question 17

0.5*(7+11)*4 oe	M1
36 m² cao	A1

Answer: **36 m^2**

Question 18

16 x 8 = 128	M1
11 x 2 = 22	M1
106 cm² cao	A1

Answer: **106 cm^2**

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Question 19

6 x 5 = 30	M1
150 ÷ 30	M1
5 cm cao	A1

Answer: **5 cm**

Question 20

(a) 2*π*6 oe	M1
(a) awrt 37.7 m	A1

(a) Answer: **37.7 m (3 sf)**

(b) π*15 oe	M1
(b) awrt 47.1 cm	A1

(b) Answer: **47.1 cm (3 sf)**

Question 21

0.5*6*5 (=15, cross-sectional area) oe	M1
15*11 oe	M1
165 cm³ cao	A1

Answer: **165 cm^3**

Question 22

5*3.6 (=18, area of room) oe	M1
18*21.75 oe	M1
£391.50 cao	A1

Answer: **£391.50**

Question 23

0.5*(6+13)*5 oe	M1
47.5 m² cao	A1

Answer: **47.5 m^2**

Question 24

2*π*7 oe	M1
awrt 44.0 m	A1

Answer: **44.0 m (3 sf)**

Question 25

π*18 oe	M1
awrt 56.5 cm	A1

Answer: **56.5 cm (3 sf)**

Question 26

(a) (90/360)*2*π*3.5 oe	M1
(a) awrt 5.50 m	A1

(a) Answer: **5.50 m (3 sf)**

(b) (90/360)*π*3.5^2 oe	M1
(b) awrt 9.62 m²	A1

(b) Answer: **9.62 m^2 (3 sf)**

Question 27

12*5*0.15 oe	M1
9 m³ cao	A1

Answer: **9 m^3**

Question 28

(a) (90/360)*2*π*4.2 oe	M1
(a) awrt 6.60 m	A1

(a) Answer: **6.60 m (3 sf)**

(b) (90/360)*π*4.2^2 oe	M1
(b) awrt 13.9 m²	A1

(b) Answer: **13.9 m^2 (3 sf)**

Question 29

0.5*3*4 (=6, triangle area) oe	M1
6*2 (=12, two triangular faces) oe	M1
(3+4+5)*12 (=144, three rectangular faces) oe	M1
156 cm² cao (12+144)	A1

Answer: **156 cm^2**

Question 30

(a) 5*2.8 - (1.4*1.2) - (0.8*2) oe, complete method	M1
(a) 10.72 m² cao	A1

(a) Answer: **10.72 m^2**

(b) 10.72/10 (=1.072 litres needed), ft from part (a)	M1
(b) 1 tin cao ft, with reason that 1.072 < 2	A1

(b) Answer: **1 tin**

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