

1

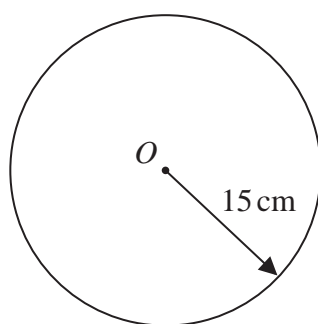


Diagram **NOT**  
accurately drawn

The diagram shows a circle, centre  $O$ , with radius 15 cm.

Work out the area of the circle.

Give your answer in  $\text{cm}^2$  correct to the nearest whole number.

$$\text{Area of a circle} = \pi r^2$$

$$\text{Area} = \pi \times 15 \times 15 \quad (1)$$

$$= \pi \times 225 \quad \leftarrow \text{put this into a calculator, or use } \pi \approx 3.1415\dots$$

$$= 706.8\dots$$

$$\approx 707 \quad \leftarrow \begin{array}{l} .8 \text{ is bigger than } .5, \\ \text{so round up} \end{array}$$

$$\underline{\quad 707 \quad (1) \quad} \text{ cm}^2$$

(Total for Question 1 is 2 marks)

- 2 Here is a diagram of a trapezium.

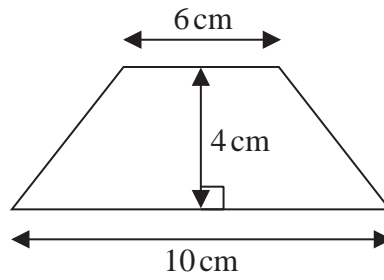


Diagram **NOT**  
accurately drawn

- (e) Work out the area of the trapezium.

$$\text{Area} = \frac{1}{2} \times (10 + 6) \times 4 = 32 \text{ cm}^2$$

(1) (1)

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

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(Total for Question 2 is 2 marks)

3 The diagram shows the plan of Sophia's gym floor.



Diagram **NOT**  
accurately drawn

Sophia is going to paint all the gym floor.

Each tin of paint she is going to use covers an area of  $20\text{ m}^2$

There is a special offer on the paint that Sophia is going to buy.

**Special Offer**

1 tin for \$13  
4 tins for \$40

Work out the least amount of money that Sophia has to pay in order to buy all the paint she needs.  
Show your working clearly.

Finding the total area of gym floor :

$$\frac{1}{2} \times (20 + 26) \times 12 = 276 \text{ m}^2 \quad (1)$$

Finding number of paint tins she needs :

$$\frac{276 \text{ m}^2}{20 \text{ m}^2} = 13.8 \text{ tins} \quad (1)$$

$\therefore$  She needs 14 tins (13.8 is not a whole number)

• To buy 14 tins      Option 1 :  $14 \times \$13 = \$182 \quad (1)$

Option 2 :  $4 \times \$40 = \$160$

Option 3 :  $(3 \times \$40) + (2 \times \$13) = \$146 \quad (1)$

\$ 146

(Total for Question 3 is 5 marks)

4 The diagram shows an isosceles triangle.

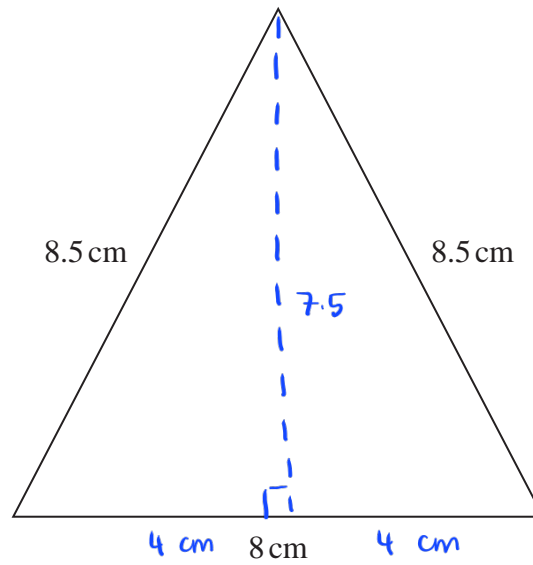
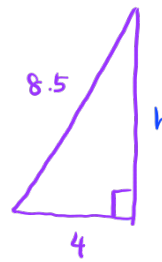


Diagram **NOT**  
accurately drawn

Work out the area of the triangle.

By using Pythagoras' Theorem :

$$\begin{aligned} h &= \sqrt{8.5^2 - 4^2} \\ &= \sqrt{56.25} \text{ ①} \\ &= 7.5 \text{ cm ①} \end{aligned}$$



Area of triangle :  $\frac{1}{2} \times \text{base} \times \text{height}$

$$= \frac{1}{2} \times 8 \text{ cm} \times 7.5 \text{ cm ①}$$

$$= 30 \text{ cm}^2 \text{ ①}$$

30

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

(Total for Question 4 is 4 marks)

5 Here is a rectangle.

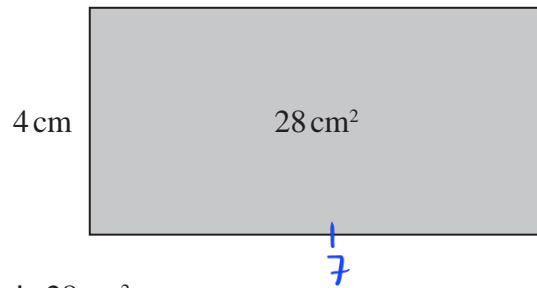


Diagram **NOT** accurately drawn

The area of the rectangle is  $28 \text{ cm}^2$

Three of these rectangles are used to make the shape below.

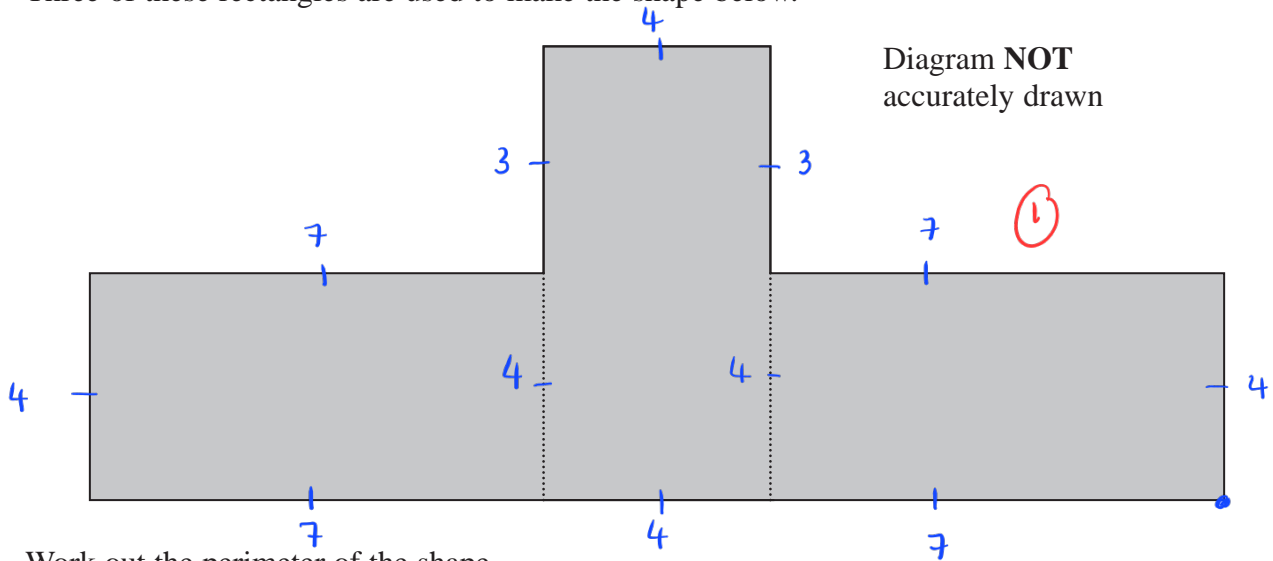


Diagram **NOT** accurately drawn

Work out the perimeter of the shape.

$$\begin{aligned} \text{Area} &= \text{length} \times \text{height} \\ 28 &= \text{length} \times 4 \\ \text{length} &= 28 / 4 = 7 \quad \textcircled{1} \end{aligned}$$

$$\begin{aligned} \text{Perimeter} &: 4 + 7 + 3 + 4 + 3 + 7 + 4 + 7 + 4 + 7 \quad \textcircled{1} \\ &= 50 \end{aligned}$$

50  $\textcircled{1}$  cm

(Total for Question 5 is 4 marks)

6 The diagram shows Yuen's garden.

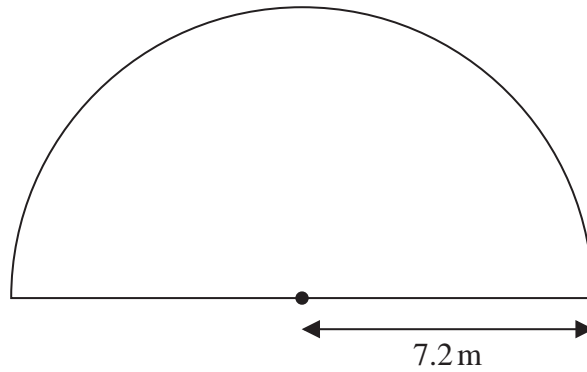


Diagram **NOT**  
accurately drawn

The garden is in the shape of a semicircle of radius 7.2 m.  
Yuen is going to cover his garden with grass seed.

Yuen has 12 boxes of grass seed.

Each box of grass seed contains enough seed to cover  $6 \text{ m}^2$  of the garden.

Has Yuen enough grass seed for his garden?

Show your working clearly.

$$\text{Area of semicircle} = \frac{\pi r^2}{2}$$

$$\text{Area of semicircle} = \frac{\pi (7.2)^2}{2} = 81.43 \text{ m}^2 \quad (1)$$

$$\text{Amount of grass seed} = 12 \times 6 = 72 \text{ m}^2 \quad (1)$$

No, Yuen does not have enough grass seed for his garden. He only has enough grass seed to cover  $72 \text{ m}^2$  which is less than  $81.43 \text{ m}^2$ . (1)

7 The diagram shows a box in the shape of a cuboid.

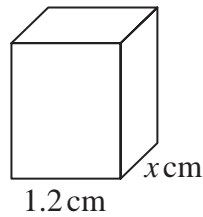


Diagram **NOT**  
accurately drawn

The box is put on a table.

The face of the box in contact with the table has length 1.2 metres and width  $x$  metres.

The force exerted by the box on the table is 27 newtons.

The pressure on the table due to the box is 30 newtons/m<sup>2</sup>

$\text{pressure} = \frac{\text{force}}{\text{area}}$
--

Work out the value of  $x$ .

Area of the base of the box :

$$1.2 \times m^2$$

$$30 \text{ N/m}^2 = \frac{27 \text{ N}}{1.2 \times m^2} \quad (1)$$

$$1.2x = \frac{27}{30}$$

$$1.2x = 0.9$$

$$x = \frac{0.9}{1.2} \quad (1)$$

$$= 0.75 \quad (1)$$

$$x = 0.75$$

(Total for Question 7 is 3 marks)

- 8 Here is a rectangle made from 12 square tiles.

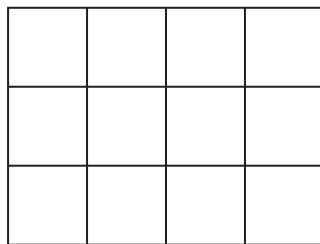


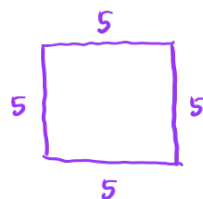
Diagram **NOT**  
accurately drawn

The perimeter of each tile is 20 cm.

Work out the area of the rectangle.

Perimeter of each tile = 20 cm

Each tile has 4 sides.



$$\frac{20}{4} = 5 \text{ cm} \quad (1)$$

$$\begin{aligned} \text{Area of 1 tile} &= 5 \times 5 \\ &= 25 \text{ cm}^2 \end{aligned}$$

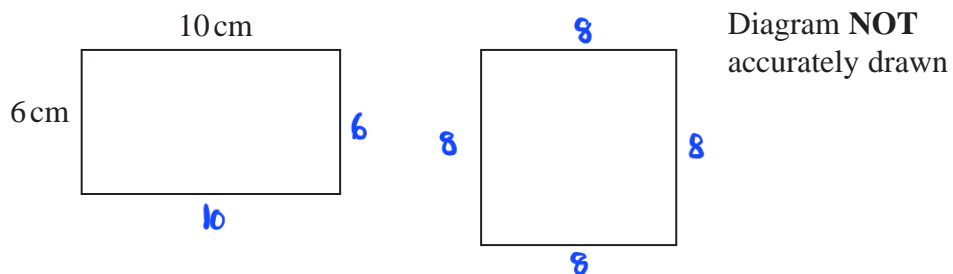
$$\begin{aligned} \text{Area of 12 tiles} &= 25 \text{ cm}^2 \times 12 \quad (1) \\ &= 300 \text{ cm}^2 \quad (1) \end{aligned}$$

$$\text{.....} \quad 300 \quad \text{cm}^2$$

(Total for Question 8 is 3 marks)



- 9 The diagram shows a rectangle and a square.



The perimeter of the rectangle is equal to the perimeter of the square.  
The area of the rectangle is less than the area of the square.

Work out by how much the area of the rectangle is less than the area of the square.

Rectangle

$$\begin{aligned}\text{Perimeter} &= 10 + 10 + 6 + 6 \\ &= 32 \text{ cm} \quad (1)\end{aligned}$$

$$\begin{aligned}\text{Area} &= 10 \times 6 \\ &= 60 \text{ cm}^2 \quad (1)\end{aligned}$$

Square

$$\text{Perimeter} = 32 \text{ cm} \quad (\text{each side } 8 \text{ cm})$$

$$\begin{aligned}\text{Area} &= 8 \times 8 \\ &= 64 \text{ cm}^2 \quad (1)\end{aligned}$$

$$\text{Difference} : 64 - 60 = 4 \text{ cm}^2 \quad (1) \quad \dots\dots\dots 4 \text{ cm}^2$$

(Total for Question 9 is 4 marks)

**10** A circle has radius 7.5 cm

Work out the area of the circle.

Give your answer correct to 3 significant figures.

Area of a circle :  $\pi \times r^2$

$$= \pi \times 7.5^2 \quad (1)$$

$$= 177 \text{ cm}^2 \quad (1)$$

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

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(Total for Question 10 is 2 marks)

11 A circle has diameter 18 cm.

Work out the area of the circle.

Give your answer correct to 3 significant figures.

$$\text{Area of circle} : \pi \times r^2$$

$$= \pi \times \left(\frac{18}{2}\right)^2 \text{ (1)}$$

$$= \pi \times 9^2$$

$$= 254 \text{ (1)}$$

$$\dots\dots\dots 254 \dots\dots\dots \text{cm}^2$$

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(Total for Question 11 is 2 marks)

- 12** The diagram shows a rectangle  $ABCD$  and a semicircle with diameter  $AB$  where  $AB = 12$  cm. The point  $E$  lies on  $DC$  and also on the semicircle.

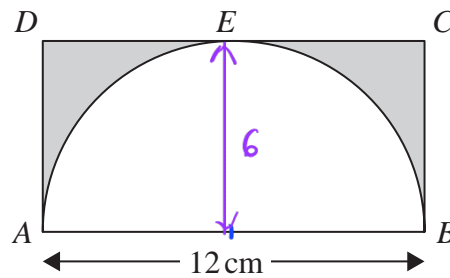


Diagram **NOT** accurately drawn

radius = 6 cm

Work out the area of the shaded region.  
Give your answer correct to 3 significant figures.

$$\text{Area of rectangle} = 12 \times 6 = 72 \text{ cm}^2 \quad (1)$$

$$\text{Area of Semicircle} = \frac{1}{2} \times \pi \times 6^2 = 56.54 \text{ cm}^2$$

$$\text{Area of shaded region} = \text{Area of rectangle} - \text{Area of semicircle}$$

$$= 72 \text{ cm}^2 - 56.54 \text{ cm}^2 \quad (1)$$

$$= 15.5 \text{ cm}^2 \quad (1)$$

$$\dots\dots\dots 15.5 \text{ cm}^2$$

(Total for Question 12 is 3 marks)

13 The diagram shows a right-angled triangle.

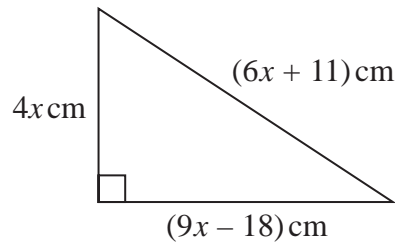


Diagram **NOT**  
accurately drawn

The perimeter of the triangle is 126 cm.

Work out the area of the triangle.

$$\begin{aligned}\text{Perimeter} &= 4x + 6x + 11 + 9x - 18 \\ &= 19x - 7\end{aligned}$$

$$126 = 19x - 7 \quad (1)$$

$$126 + 7 = 19x$$

$$133 = 19x$$

$$x = 7 \quad (1)$$

$$\begin{aligned}\text{Length of triangle} &= 9(7) - 18 \\ &= 45 \text{ cm}\end{aligned}$$

$$\begin{aligned}\text{Height of triangle} &= 4 \times 7 \\ &= 28 \text{ cm}\end{aligned}$$

$$\begin{aligned}\text{Area of triangle} &= \frac{1}{2} \times 28 \times 45 \quad (1) \\ &= 630 \text{ cm}^2\end{aligned}$$

$$630 \quad (1) \text{ cm}^2$$

(Total for Question 13 is 4 marks)

14 The diagram shows a trapezium.

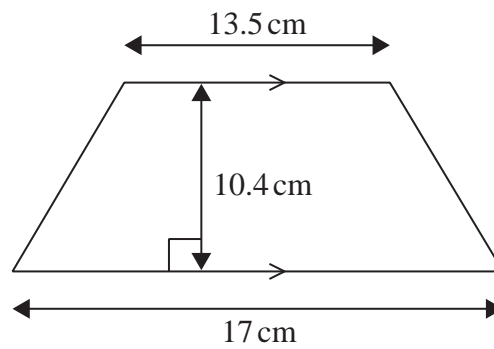


Diagram **NOT**  
accurately drawn

(a) Work out the area of the trapezium.

$$= \frac{1}{2} \times (17 + 13.5) \times 10.4 \quad (1)$$

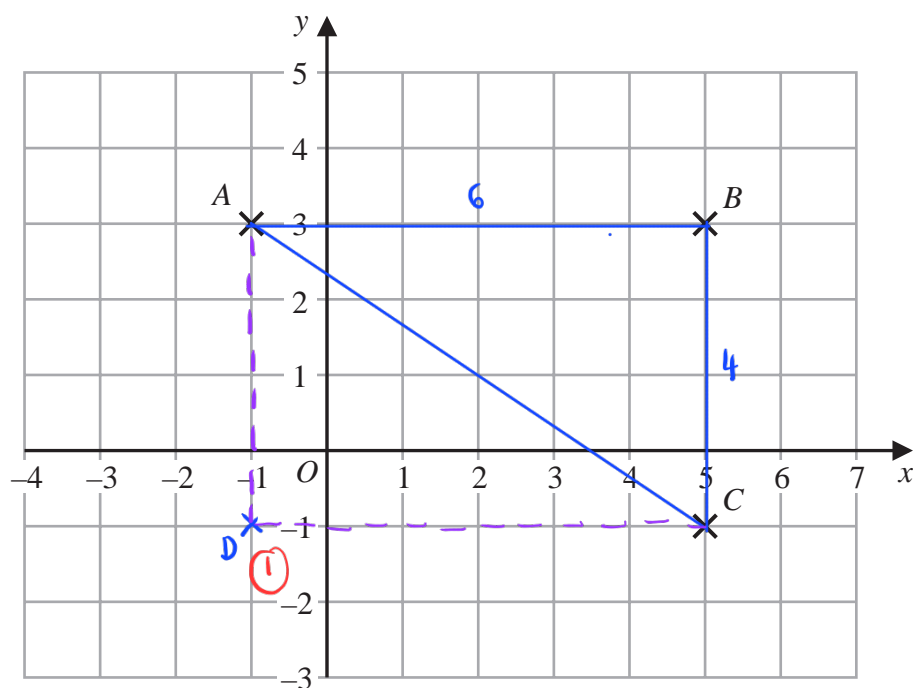
$$= \frac{1}{2} \times 30.5 \times 10.4$$

$$= 158.6 \quad (1)$$

$$\begin{array}{r} 158.6 \\ \hline (2) \end{array} \text{ cm}^2$$

(Total for Question 14 is 2 marks)

15 The three points  $A$ ,  $B$  and  $C$  are marked on a centimetre grid.



(c) Work out the area of triangle  $ABC$

$$\text{Area} : \frac{1}{2} \times 6 \times 4 \quad \textcircled{1}$$

$$= 12 \text{ cm}^2 \quad \textcircled{1}$$

.....  $\text{cm}^2$   
(2)

(Total for Question 15 is 2 marks)

16 The diagram shows a trapezium.

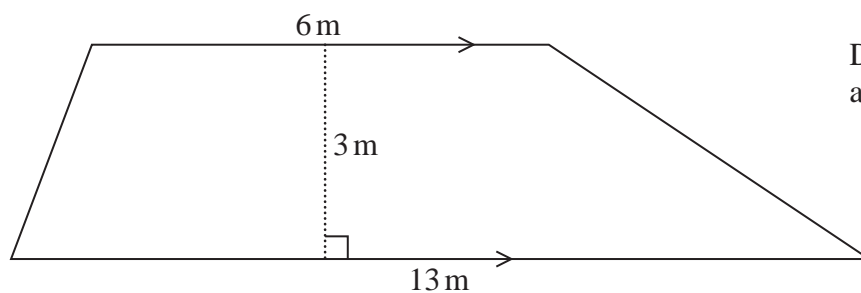


Diagram **NOT**  
accurately drawn

Work out the area of the trapezium.

$$A = \frac{1}{2} \times (\text{sum of parallel sides}) \times \text{height}$$

$$A = \frac{1}{2} \times (6 + 13) \times 3 \quad \textcircled{1}$$

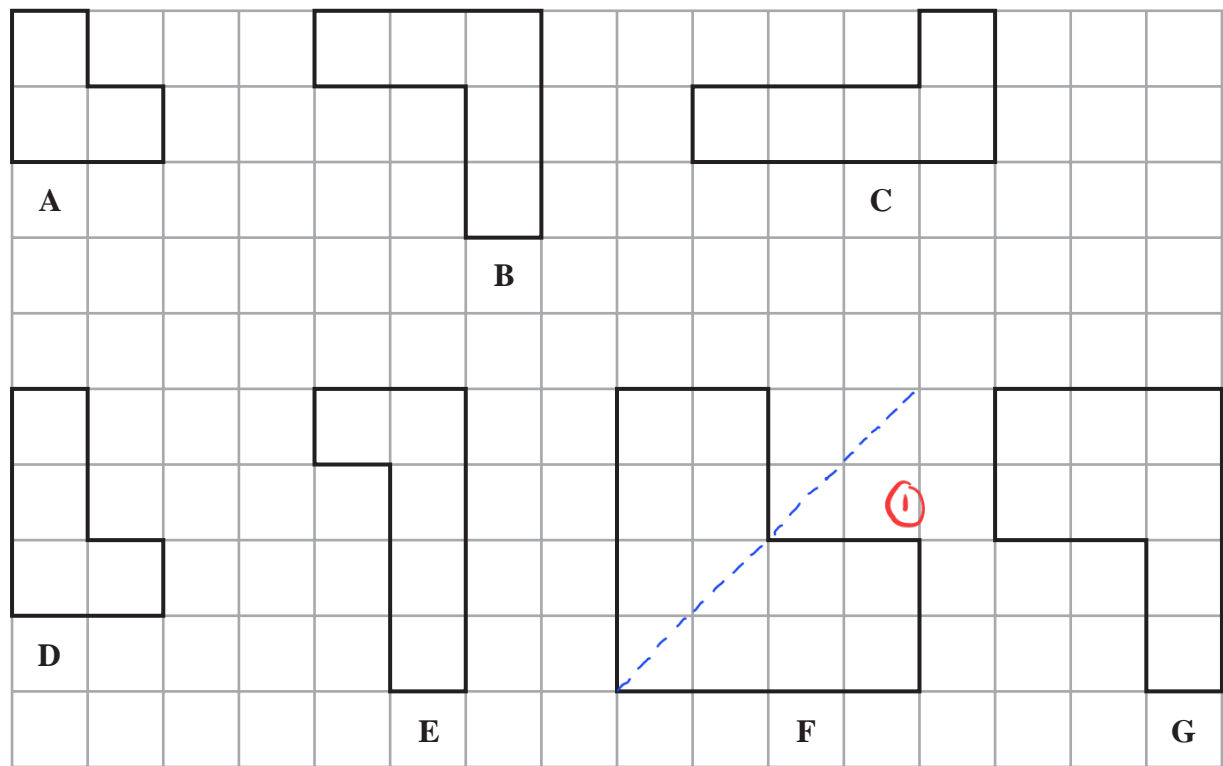
$$= 28.5 \quad \textcircled{1}$$

..... 28.5 m<sup>2</sup>

(Total for Question 16 is 2 marks)



17 Here are seven shapes on a centimetre grid.

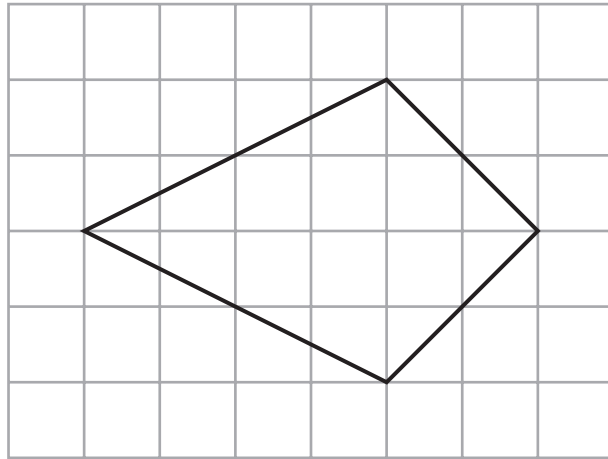


(e) Work out the area of shape G.

8 (1) cm<sup>2</sup>

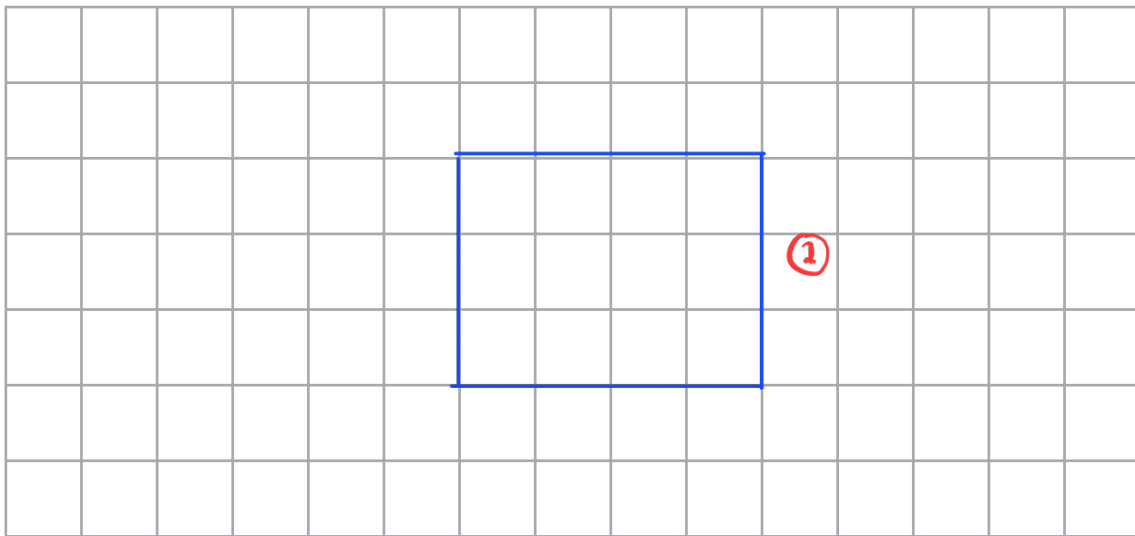
(Total for Question 17 is 1 marks)

18 The diagram shows a kite drawn on a centimetre grid.



Area = 12 ①

On the centimetre grid below, draw a rectangle that has the same area as the kite.



Area = 12

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(Total for Question 18 is 3 marks)

19 A circle has a **diameter** of 14 cm.

Calculate the area of the circle.

Give your answer correct to 3 significant figures.

$$\text{radius} = \frac{14}{2} = 7 \text{ cm}$$

$$\text{Area} = \pi \times 7^2 \quad (1)$$

$$= 49\pi$$

$$= 154 \quad (1)$$

$$\dots\dots\dots 154 \text{ cm}^2$$

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(Total for Question 19 is 2 marks)

20 The diagram shows isosceles triangle  $ABC$

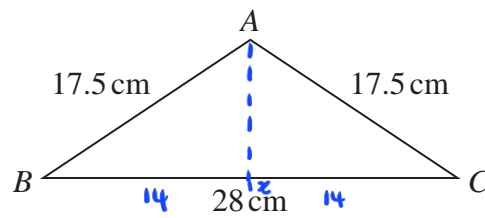


Diagram **NOT**  
accurately drawn

$$AB = AC = 17.5 \text{ cm}$$

$$BC = 28 \text{ cm}$$

Calculate the area of triangle  $ABC$

$$\begin{aligned} \text{Alt} &= \sqrt{17.5^2 - 14^2} \quad (1) \\ &= \sqrt{110.25} \\ &= 10.5 \quad (1) \end{aligned}$$

$$\begin{aligned} \text{Area } ABC &= 2 \times \frac{1}{2} \times 10.5 \times 14 \quad (1) \\ &= 147 \text{ cm}^2 \quad (1) \end{aligned}$$

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

(Total for Question 20 is 4 marks)

21 The diagram shows an isosceles triangle  $ABC$

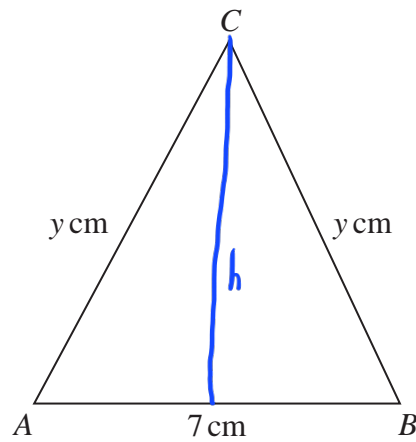


Diagram **NOT**  
accurately drawn

$$AB = 7\text{ cm} \quad AC = BC = y\text{ cm}$$

The area of the triangle is  $42\text{ cm}^2$

Work out the value of  $y$

$$\text{Area} : \frac{1}{2} \times 7 \times h = 42$$

$$h = 12 \quad (1)$$

$$y^2 = 12^2 + 3.5^2 \quad (1)$$

$$y = \sqrt{12^2 + 3.5^2} \quad (1)$$

$$= 12.5 \quad (1)$$

$$y = \underline{\underline{12.5}}$$

(Total for Question 21 is 4 marks)

22  $R$  and  $T$  are points on a circle, centre  $O$

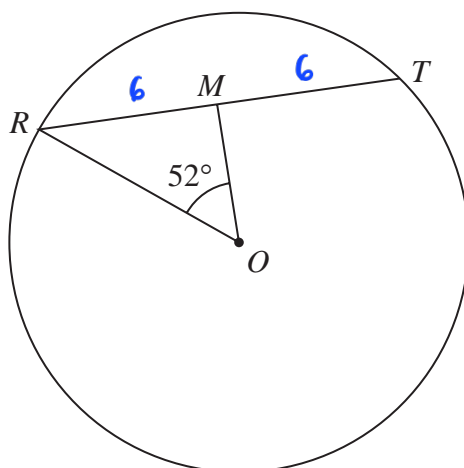


Diagram **NOT**  
accurately drawn

$$RT = 12 \text{ cm}$$

$M$  is the midpoint of  $RT$

$$\text{Angle } ROM = 52^\circ$$

Work out the area of the circle.

Give your answer correct to 3 significant figures.

$$\sin 52^\circ = \frac{6}{r} \quad (1)$$

$$r = \frac{6}{\sin 52^\circ} \quad (1)$$

$$\approx 7.614$$

$$\text{Area} = \pi \times 7.614^2 \quad (1)$$

$$\approx 182 \quad (1)$$

182

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

(Total for Question 22 is 4 marks)

23 The diagram shows an isosceles triangle, with base length 24 cm.

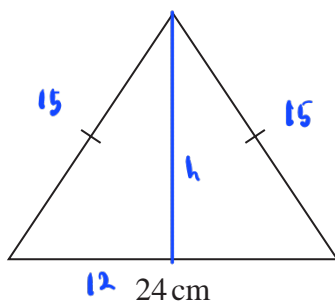


Diagram **NOT**  
accurately drawn

The perimeter of the triangle is 54 cm.

Work out the area of the triangle.

$$2x + 24 = 54$$

$$x = 15 \quad (1)$$

$$h^2 = 15^2 - 12^2 \quad (1)$$

$$h = \sqrt{81} \quad (1)$$

$$= 9$$

$$\text{Area} = \frac{1}{2} \times 9 \times 24 \quad (1)$$

$$= 108 \quad (1)$$

108

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

(Total for Question 23 is 5 marks)

24 A field is in the shape of a trapezium.

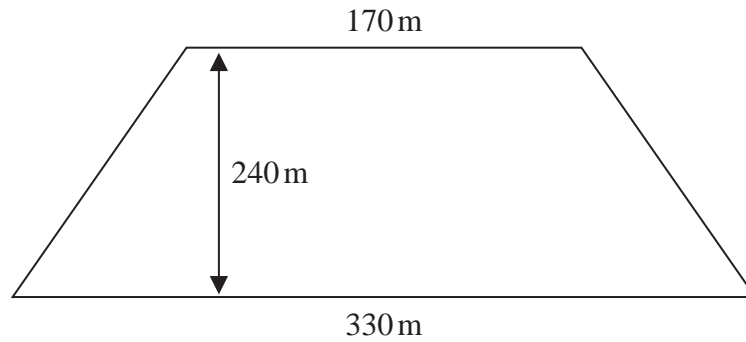


Diagram **NOT**  
accurately drawn

The field is sold for a price of \$49 650

Given that 1 hectare = 10 000 m<sup>2</sup>

work out the average price of the field per hectare.

$$\text{Area} = \frac{1}{2} \times 240 \times (170 + 330) \quad (1)$$

$$= 120 \times 500$$

$$= 60\,000 \text{ m}^2$$

$$\text{in hectare} : \frac{60\,000}{10\,000} \quad (1)$$

$$= 6 \text{ hectares}$$

$$\text{price per hectare} = \frac{49\,650}{6} = 8275 \quad (1)$$

\$8275

(Total for Question 24 is 4 marks)