

2 The diagram shows a rectangle  $ABCD$  and a semicircle with diameter  $AB$  where  $AB = 12 \text{ cm}$ . The point  $E$  lies on  $DC$  and also on the semicircle.

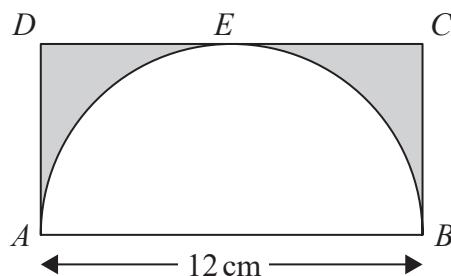


Diagram **NOT**  
accurately drawn

Work out the area of the shaded region.

Give your answer correct to 3 significant figures.

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

**(Total for Question 2 is 3 marks)**

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4 The diagram shows the front of a wooden door with a semicircular glass window.

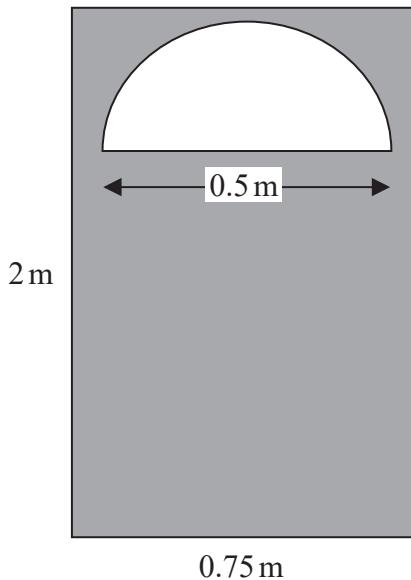


Diagram **NOT**  
accurately drawn

Julie wants to apply 2 coats of wood varnish to the front of the door, shown shaded in the diagram.

250 millilitres of wood varnish covers  $4\text{ m}^2$  of the wood.

Work out how many millilitres of wood varnish Julie will need.  
Give your answer correct to the nearest millilitre.

..... millilitres

**(Total for Question 4 is 5 marks)**



P 6 5 9 1 5 R A 0 5 2 4

8  $A, B$  and  $C$  are points on a circle with centre  $O$ .

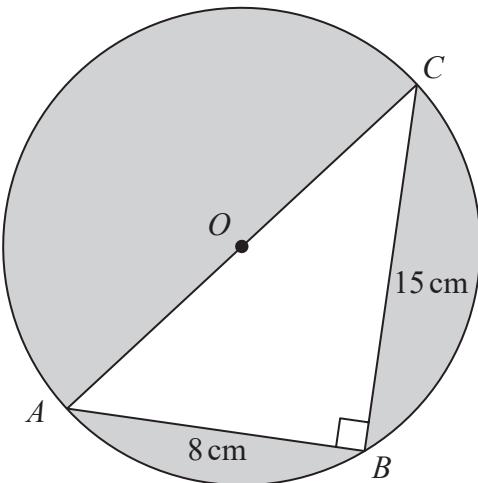


Diagram **NOT**  
accurately drawn

$AOC$  is a diameter of the circle.

$$AB = 8 \text{ cm} \quad BC = 15 \text{ cm}$$

$$\text{Angle } ABC = 90^\circ$$

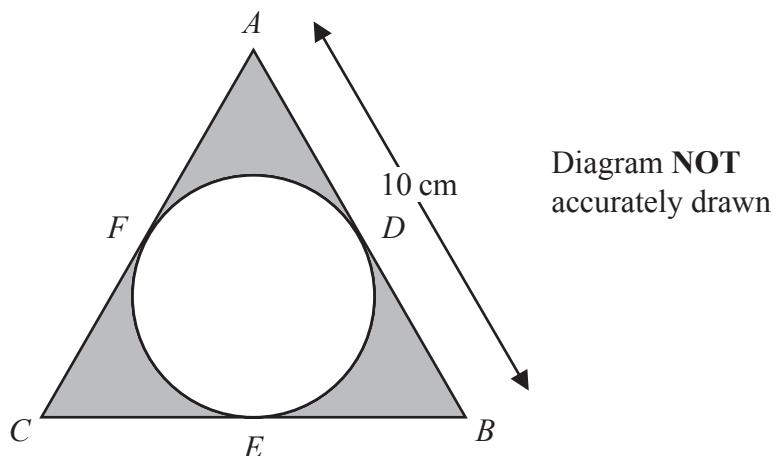
Work out the total area of the regions shown shaded in the diagram.  
Give your answer correct to 3 significant figures.

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

(Total for Question 8 is 5 marks)



20 The diagram shows equilateral triangle  $ABC$  with sides of length 10 cm. A circle is drawn inside the triangle.



$D$ ,  $E$  and  $F$  are points on the circle.

$ADB$ ,  $BEC$  and  $CFA$  are tangents to the circle.

Calculate the total area of the regions shown shaded in the diagram.  
Give your answer correct to 3 significant figures.

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

(Total for Question 20 is 4 marks)



**20** The diagram shows four identical circles drawn inside a square.

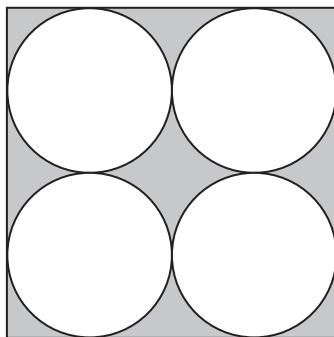


Diagram **NOT**  
accurately drawn

Each circle touches two other circles and two sides of the square.

The region inside the square that is outside the circles, shown shaded in the diagram, has a total area of  $40\text{ cm}^2$

Work out the perimeter of the square.

Give your answer correct to 3 significant figures.

..... cm

**(Total for Question 20 is 4 marks)**



**21** The diagram shows a square  $ABCD$  and a circle.

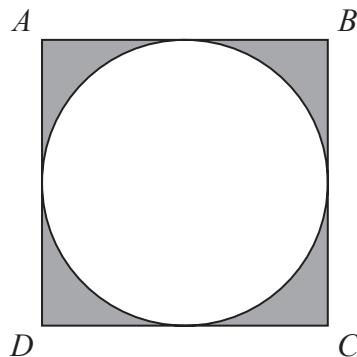


Diagram **NOT**  
accurately drawn

The sides of the square are tangents to the circle.

The total area of the shaded regions is  $80 \text{ cm}^2$

Work out the length of  $AC$

Give your answer correct to 3 significant figures.

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**(Total for Question 21 is 5 marks)**



20

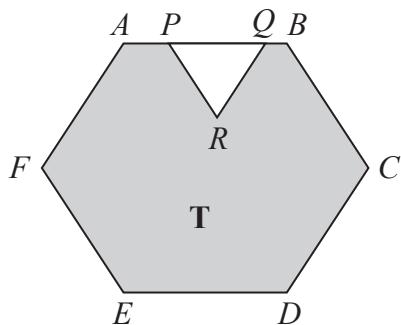


Diagram NOT  
accurately drawn

The diagram shows a shaded region **T** formed by removing an equilateral triangle  $PQR$  from a regular hexagon  $ABCDEF$ .

The points  $P$  and  $Q$  lie on  $AB$  such that  $AB = 1.5 \times PQ$

Given that the area of region **T** is  $72\sqrt{3}$  cm<sup>2</sup>

work out the length of  $PQ$ .

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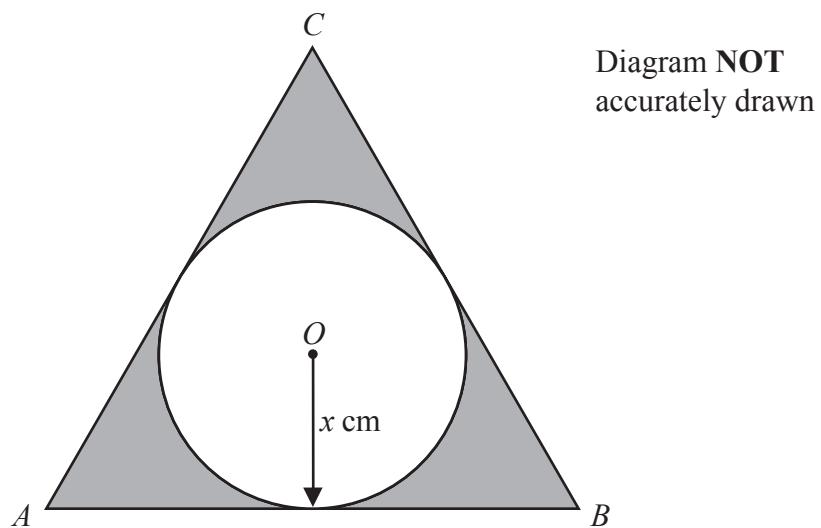
..... cm

(Total for Question 20 is 4 marks)



P 6 6 3 0 1 A 0 2 3 2 8

25 The diagram shows an equilateral triangle  $ABC$  and a circle with centre  $O$



$AB$ ,  $BC$  and  $CA$  are tangents to the circle.

The radius of the circle is  $x$  cm

The total area, in  $\text{cm}^2$ , of the regions shown shaded in the diagram is  $nx^2$

Find the value of  $n$

Give your answer correct to 3 significant figures.

$n = \dots$

**(Total for Question 25 is 5 marks)**



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