

Name: _____

Exam Style Questions



Area of a Semi-Circle Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

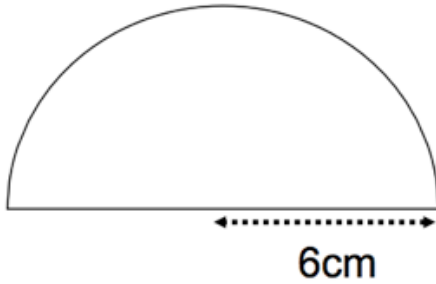
Revision for this topic

www.corbettmaths.com/contents

Video 47



1. Shown is a semi-circle.



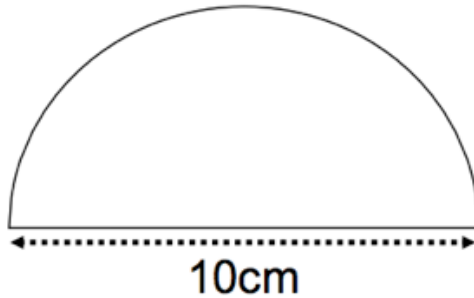
Work out the area.
State the units for your answer.

$$\frac{1}{2} (\pi \times 6^2) = 18\pi$$
$$= 56.55$$

$$\underline{56.55 \text{ cm}^2}$$

(3)

2. Shown is a semi-circle.



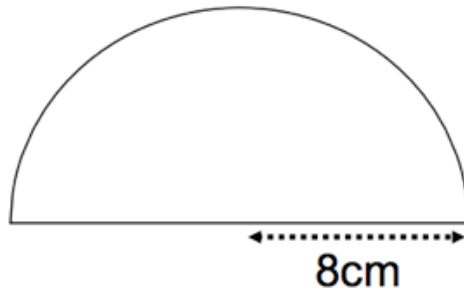
Work out the area.
State the units for your answer.

$$\frac{1}{2} (\pi \times 5^2) = 12.5\pi$$
$$= 39.27$$

$$\underline{39.27 \text{ cm}^2}$$

(3)

3. Below is a semi-circle.

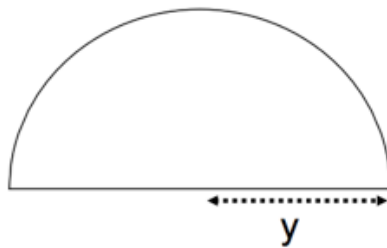


Work out the area of the semi-circle.
Leave your answer in terms of π

$$\begin{aligned} & \frac{1}{2}(\pi \times 8^2) \\ & \frac{1}{2}(\pi \times 64) = 32\pi \end{aligned}$$

.....cm²
(3)

4. The semi-circle below has an area of 40cm²

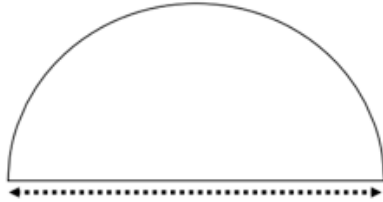


Calculate y.

$$\begin{aligned} & \frac{1}{2}(\pi \times y^2) = 40 \\ & \pi \times y^2 = 80 \\ & y^2 = 25.464... \\ & y = 5.046... \end{aligned}$$

.....cm
(3)

5. The semi-circle below has an area of $50\pi \text{ cm}^2$



Calculate y .

$$\frac{1}{2} (\pi \times (\frac{1}{2}y)^2) = 50\pi$$

$$\cancel{\pi} \times (\frac{1}{2}y)^2 = 100\cancel{\pi}$$

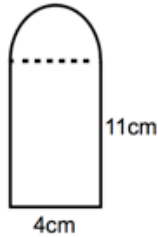
$$(\frac{1}{2}y)^2 = 100$$

$$\frac{1}{2}y = 10$$

$$\underline{\underline{20}} \text{ cm}$$

(3)

6. Shown below is a compound shape made from a rectangle and semi-circle.



$$\text{Rectangle: } 44 \text{ cm}^2$$

$$\text{Semi-circle: } \frac{1}{2} (\pi \times 2^2)$$

$$= 6.28318\dots$$

Calculate the area of the shape.

$$44 + 6.28\dots = 50.283\dots$$

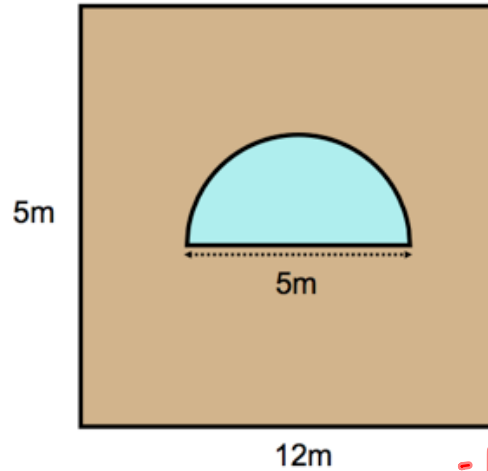
$$\underline{\underline{50.28}} \text{ cm}^2$$

(3)

7. The side of a wooden shed is shown below.
There is a semi-circular glass window, 5m wide.



Not to scale



Rectangle
 $5 \times 12 = 60 \text{ m}^2$

Window
 $\frac{1}{2} (\pi \times 2.5^2) = 9.817\dots$

James wants to paint the shed.
Each tin costs £1.99 and covers 5m^2

Work out the total cost to paint the shed.

$$60 - 9.817\dots = 50.1825\dots$$

$$50.1825\dots \div 5 = 10.03\dots$$

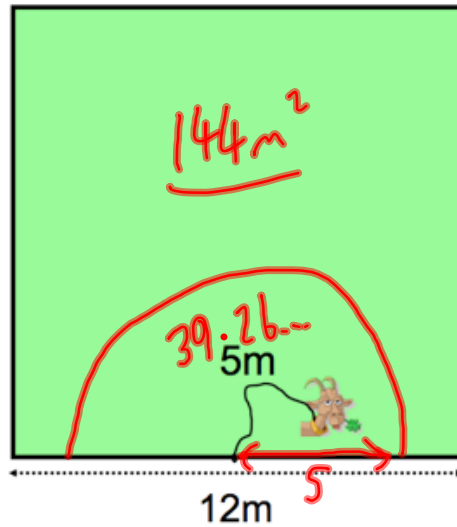
11 tins needed.

$$11 \times 1.99 = 21.89$$

$$\text{£ } \underline{21.89}$$

(5)

8. A goat is in a square field which has length 12m.
The goat is tied to the middle of a 12m fence on one side with a 5m rope.



Work out the percentage of the field the goat can reach.

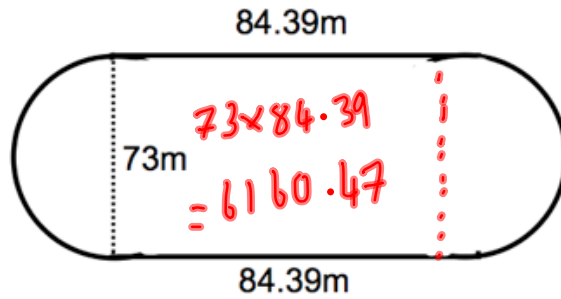
$$12 \times 12 = 144$$
$$\frac{1}{2}(\pi \times 5^2) = 39.2699\dots$$

$$\frac{39.2699\dots}{144} \times 100 = 27.27\dots$$

$$\underline{\underline{27.3}}\%$$

(5)

9. Shown below is a 400m running track.



Calculate the area inside the running track.

$$\text{rectangle} = 6160.47 \text{ m}^2$$

$$2 \text{ semi circles form one circle. } 73 \div 2 = 36.5$$

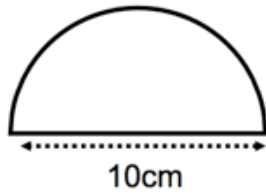
$$\pi \times 36.5^2 = 4185.38 \dots$$

$$6160.47 + 4185.38 \dots =$$

$$\underline{10345.9} \text{ m}^2$$

(4)

10.



The semi-circle and square have the same area.

Calculate the side length of the square.

$$\frac{1}{2}(\pi \times 5^2) = 39.269 \dots$$

$$\sqrt{39.269 \dots} = 6.267 \text{ cm}$$

$$\underline{\underline{6.267}} \text{ cm}$$

(4)