

Name: _____

Exam Style Questions

Arc Length



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

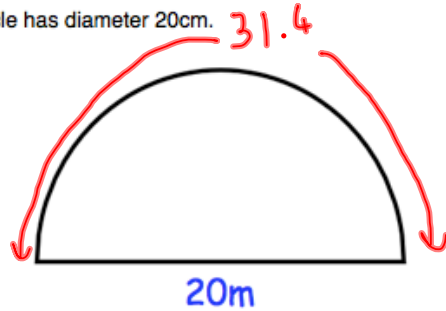
Revision for this topic

www.corbettmaths.com/contents

Video 58



1. A semi-circle has diameter 20cm.



Taking $\pi = 3.14$, calculate the perimeter of the semi-circle.

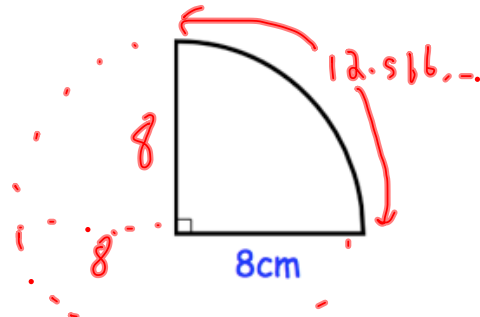
$$\frac{1}{2} \times \pi \times 20 = 31.4$$

$$31.4 + 20 = 51.4$$

$$\dots\dots\dots m$$

(2)

- 2.



Calculate the perimeter of the sector.

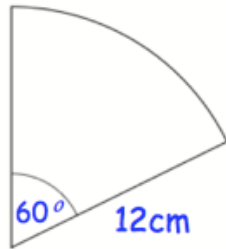
$$\frac{1}{4} \times \pi \times 16 = 12.566\dots$$

$$8 + 8 + 12.566\dots = 28.566\dots$$

$$\dots\dots\dots cm$$

(2)

3. Shown is a sector of a circle.

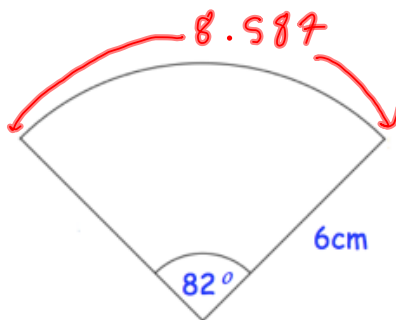


Calculate the length of the arc.

$$\begin{aligned} & \frac{60}{360} \times \pi \times 24 \\ &= \frac{1}{6} \times \pi \times 24 \\ &= 4\pi \end{aligned}$$

$$\begin{aligned} & \underline{12.566} \text{ cm} \\ & (3) \end{aligned}$$

4.

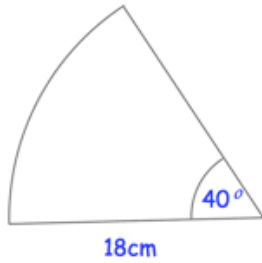


Calculate the perimeter of the ~~arc~~ *sector*.
Give your answer to 2 decimal places.

$$\begin{aligned} & \frac{82}{360} \times \pi \times 12 = 8.587 \\ & 8.587 + 6 + 6 = 20.587 \end{aligned}$$

$$\begin{aligned} & \underline{20.59} \text{ cm} \\ & (3) \end{aligned}$$

5.



Find the length of the arc, giving your answer in terms of π .

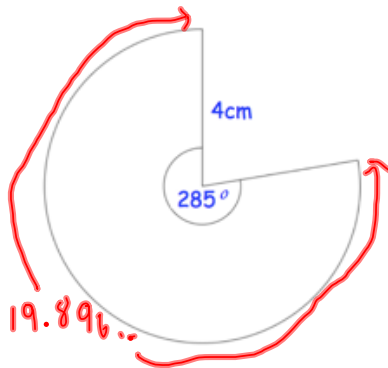
$$\frac{40}{360} \times \pi \times 36$$

$$\frac{1}{9} \times \pi \times 36$$

$$\dots 4\pi \dots \text{cm}$$

(3)

6.



Calculate the perimeter of the sector.

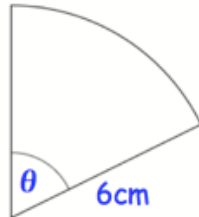
$$\frac{285}{360} \times \pi \times 8 = 19.896\dots$$

$$19.896\dots + 4 + 4 = 27.896\dots$$

$$\dots 27.897 \dots \text{cm}$$

(3)

7. Shown is a sector.



The arc length is 4.4cm.
Calculate the size of the angle.

$$\frac{\theta}{360} \times \pi \times 12 = 4.4$$

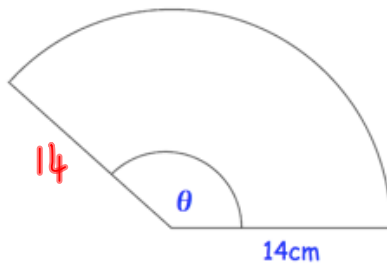
$$\frac{\theta}{360} \times \pi = 0.36$$

$$\frac{\theta}{360} = 0.1167\dots$$

$$\underline{\underline{42.017^\circ}}$$

(3)

8.



The perimeter of the sector is 57.32cm.
Calculate the size of the angle.

$$57.32 - 28 = 29.32$$

$$\frac{\theta}{360} \times \pi \times 28 = 29.32$$

$$\frac{\theta}{360} \times \pi = 1.047\dots$$

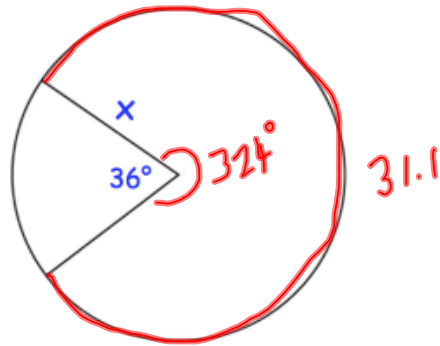
$$\frac{\theta}{360} = 0.33315\dots$$

$$\theta = 119.9937$$

$$\underline{\underline{120^\circ}} \text{ (or } 119.99)$$

(3)

9.



The major arc length is 31.1 cm.
Find the length of x , the radius of the circle.

$$\frac{324}{360} \times \pi \times 2x = 31.1$$

$$324 \times \pi \times 2x = 11196$$

$$\pi \times 2x = 34.5$$

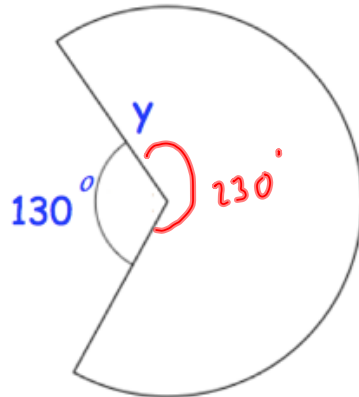
$$2x = 10.99977\dots$$

$$x = 5.49988\dots$$

$$\underline{5.5} \text{ cm}$$

(3)

10.



The perimeter of the sector is 1m.
Find the length of y , the radius of the circle.

$$\frac{230}{360} \times \pi \times 2y + 2y = 100$$

$$2.007... \times 2y + 2y = 100$$

$$4.014...y + 2y = 100$$

$$6.0142...y = 100$$

$$y = 16.627...$$

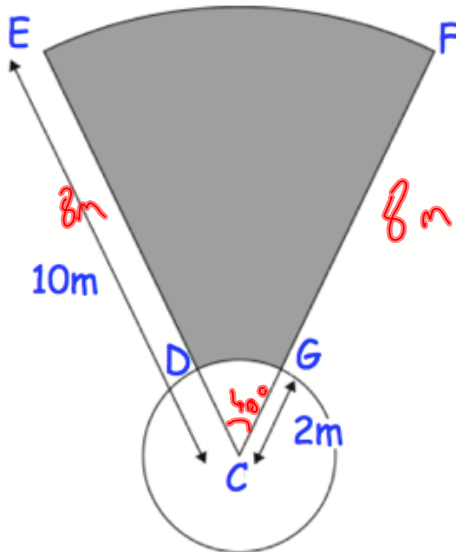
$$\underline{\underline{16.63}} \text{ cm}$$

(4)

11. The shot putt throwing area, on a school's sport field, is formed from the sectors of two circles with centre C.



Angle ECF is 40°



Calculate the perimeter of the shaded region DEFG.

$$DG = \frac{40}{360} \times \pi \times 4 = \frac{4}{9}\pi = 1.396\dots$$

$$EF = \frac{40}{360} \times \pi \times 20 = \frac{20}{9}\pi = 6.9813\dots$$

$$8 + 8 + \frac{4}{9}\pi + \frac{20}{9}\pi = 16 + \frac{24}{9}\pi = 24.378\dots \text{m}$$

(4)