



Circles and sectors

About 55 minutes Calculator allowed 43 marks

Date _____

A Do Now

The first question is what today's lesson needs. The others bring back earlier topics.

- A1** Needed today [2 marks] **A2** From chapter 4 [2 marks]
 A rectangle has a perimeter of 66 cm. Its length is 7 cm more than its width. Find its area.

Answer

Answer

- A3** From chapter 7 [2 marks] **A4** Last lesson [2 marks]
 A rectangular garden is 30 m by 16 m. A tree is planted at the point that is the same distance from all four corners. How far is the tree from each corner?

Answer

Answer

B Example, then your turn

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

A round mat has diameter 1.2 m. Work out its area, to 3 s.f.

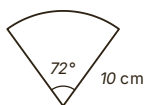
Hint Halve the diameter first: the area is πr^2 .

- B1** A round mat has diameter 1.6 m. Work out its area, to 3 s.f. [2 marks]

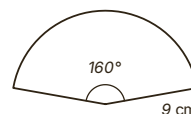
Answer

EXAMPLE 2

Work out the area of the sector, to 3 s.f.

**Hint** The sector is $\frac{72}{360}$ of the whole circle.

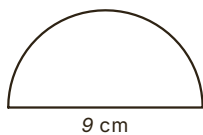
- B2** Work out the area of the sector, to 3 s.f. [2 marks]



Answer

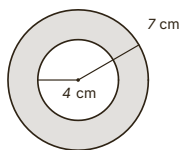
C Practice

- C1** Work out the perimeter of the semicircle, to 3 s.f. [2 marks]



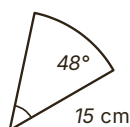
Answer

- C2** The two circles have the same centre. Work out the area of the shaded ring in terms of π . [2 marks]



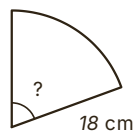
Answer

- C3** Work out the perimeter of the sector. Give it in the form $a\pi + b$. [3 marks]



Answer

- C4** The arc of the sector is 10π cm long. Work out the angle of the sector. [2 marks]



Not drawn accurately

Answer

- C5** A round pond has area 30 m^2 . [3 marks]
Work out its diameter, to 3 s.f.

Answer

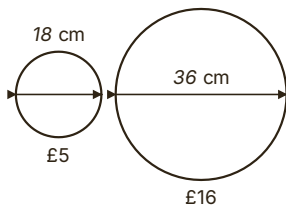
- C6** A wheel of diameter 60 cm rolls 50 m. How many complete turns does it make? [3 marks]

Answer

D Exam-style questions

D1

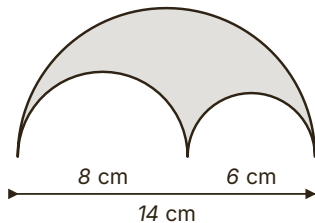
A small pizza has a diameter of 18 cm and costs £5. A large pizza has a diameter of 36 cm and costs £16. Amir says, "The large pizza is twice as wide, so it has twice the area. It costs more than three times as much, so it is worse value."



- (a) Show that the large pizza has 4 times the area of the small pizza. [2 marks]
- (b) Is Amir right that the large pizza is worse value? You must show your working. [3 marks]

Total for D1: 5 marks

- D2 The shaded shape is a semicircle of diameter 14 cm with semicircles of diameter 8 cm and 6 cm cut out along its diameter.



- (a) Show that the perimeter of the shaded shape is 14π cm. [2 marks]
- (b) Work out the area of the shaded shape. Give your answer in terms of π . [3 marks]

Answer

- (c) A circle has the same area as the shaded shape. Work out its circumference, to 3 s.f. [2 marks]

Answer

Total for D2: 7 marks

E Extension

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** A sector of a circle has radius 6 cm. The perimeter of the sector is 20 cm. Work out the area of the sector. [4 marks]

Answer cm²

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Take the two radii off the perimeter. What is left is the arc.
- Hint 2** The arc is 8 cm out of a whole circumference of 12π cm. That fraction of the circle is the sector.
- Hint 3** Area = $\frac{8}{12\pi} \times \pi \times 6^2$. The π cancels.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can work out the circumference and area of a circle, and work back to the radius. ☐ ☐ ☒

I can work out the arc length, perimeter and area of a sector, and its angle from them. ☐ ☐ ☒

I can use circles and sectors in problems, giving answers in terms of π when asked. ☐ ☐ ☒