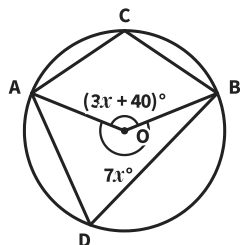


Circle Theorems: Angle at the Centre *extend*

ANSWERS

1

O is the centre. Find the value of x , then angles ACB and ADB.



Not drawn accurately

$$7x + 3x + 40 = 360 \text{ (angles at a point),}$$

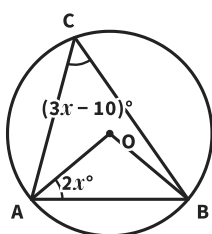
$$x = 32$$

$$ACB = 224 \div 2, ADB = 136 \div 2 \text{ (angle at the centre)}$$

Answer $x = 32, ACB = 112^\circ, ADB = 68^\circ$

2

O is the centre of the circle. Find the value of x .



Not drawn accurately

$$OA = OB, \text{ so angle } AOB = 180 - 4x$$

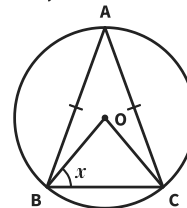
$$180 - 4x = 2(3x - 10) \text{ (angle at the centre), } 200 = 10x$$

Answer $x = 20$

3

$AB = AC$ and angle ABC is 30° more than angle BAC. O is the centre.

Find angle OBC, marked x .



Not drawn accurately

$$BAC + 2(BAC + 30) = 180, \text{ so } BAC = 40^\circ$$

$$\text{angle } BOC = 80^\circ \text{ (angle at the centre),}$$

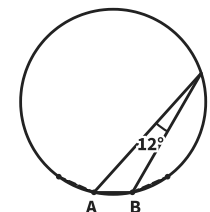
$$x = (180 - 80) \div 2$$

Answer $x = 50^\circ$

4

A, B and C are corners of a regular polygon, with A next to B.

How many sides has the polygon?



Not drawn accurately

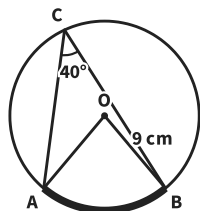
$$\text{angle } AOB = 2 \times 12 = 24^\circ \text{ (angle at the centre)}$$

$$360 \div 24 = 15$$

Answer 15 sides

5

O is the centre and the radius is 9 cm. Find the exact length of the minor arc AB, drawn bold.



Not drawn accurately

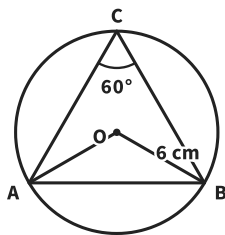
$$\text{angle } AOB = 80^\circ \text{ (angle at the centre)}$$

$$\text{arc} = \frac{80}{360} \times 2\pi \times 9 = 4\pi$$

Answer $4\pi \text{ cm}$

6

O is the centre, the radius is 6 cm and angle ACB = 60° . Show that $AB = 6\sqrt{3} \text{ cm}$.



$$\text{angle } AOB = 120^\circ; \text{ the line from } O \text{ at } 90^\circ \text{ to } AB \text{ halves it and } AB$$

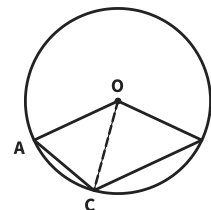
$$\text{half of } AB = 6 \sin 60^\circ = 6 \times \frac{\sqrt{3}}{2} = 3\sqrt{3}$$

$$AB = 6\sqrt{3} \text{ cm}$$

Proof

7

O is the centre and C is on the minor arc AB. Prove that angle OAC + angle OBC = angle ACB.



$$\text{join } OC: OA = OC \text{ and } OB = OC \text{ (radii)}$$

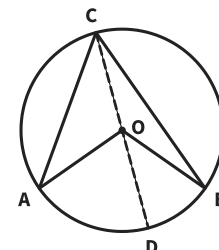
$$\text{so } OCA = OAC \text{ and } OCB = OBC, \text{ and } ACB = OCA + OCB$$

$$OAC + OBC = ACB$$

Proof

8

O is the centre. CO is extended to D. Prove that angle AOB = $2 \times$ angle ACB.



$$OA = OC, \text{ so } OAC = OCA \text{ and } AOD = 2 \times OCA \text{ (exterior angle of triangle } AOC)$$

$$\text{likewise } BOD = 2 \times OCB; \text{ add: } AOB = 2(OCA + OCB) = 2 \times ACB$$

$$AOB = 2 \times ACB$$

Proof