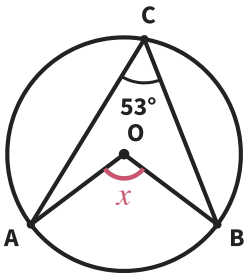
Circle theorems: the angle at the centre

ANSWERS

1

O is the centre of the circle.
Find angle AOB, marked x.

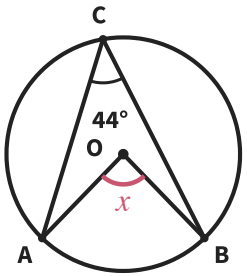


106 = 2 × 53
angle at centre = 2 × angle at circumference

x = 106°

2

O is the centre of the circle.
Find angle AOB, marked x.

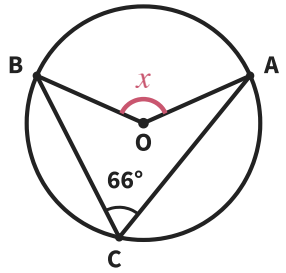


88 = 2 × 44
angle at centre = 2 × angle at circumference

x = 88°

3

O is the centre of the circle.
Find angle AOB, marked x.

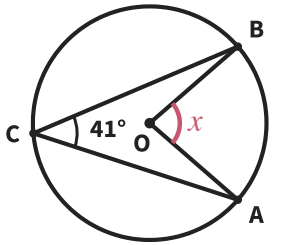


132 = 2 × 66
angle at centre = 2 × angle at circumference

x = 132°

4

O is the centre of the circle.
Find angle AOB, marked x.

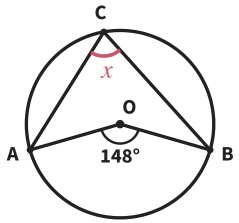


82 = 2 × 41
angle at centre = 2 × angle at circumference

x = 82°

5 Notice the change!

O is the centre of the circle.
Find angle ACB, marked x.



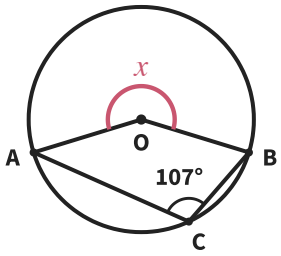
148 = 2 × 74
angle at centre = 2 × angle at circumference

Reason: the angle at the centre is twice the angle at the circumference

x = 74°

6

O is the centre. Find the reflex angle AOB, marked x. Give a reason.



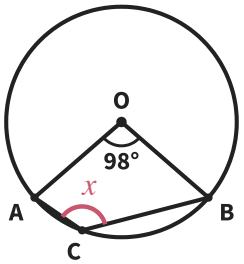
x = 2 × 107°

the angle at the centre is twice the angle at the circumference

x = 214°

7

O is the centre of the circle.
Find angle ACB, marked x.
Give your reasons.



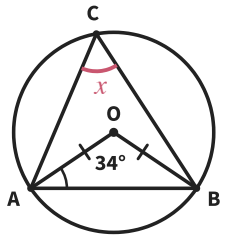
reflex angle AOB = 360° − 98° = 262°

x = 262° ÷ 2 = 131°

x = 131°

8

O is the centre of the circle.
Find angle ACB, marked x. Give a reason for each step.



angle OBA = 34° (OA = OB, radii)

angle AOB = 180° − 68° = 112°

x = 112° ÷ 2 = 56°

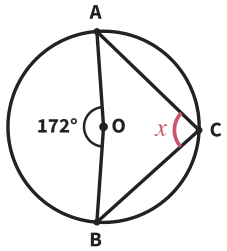
x = 56°

Circle theorems: the angle at the centre *further practice*

ANSWERS

9

O is the centre of the circle.
Find angle ACB, marked x. Give a reason.



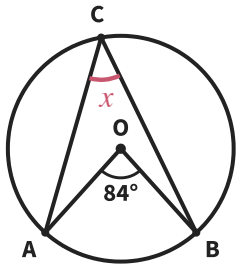
172° ÷ 2 = 86°

the angle at the centre is twice the angle at the circumference

x = 86°

10

Ravi says $x = 2 \times 84° = 168°$.
Explain his mistake, then find x.



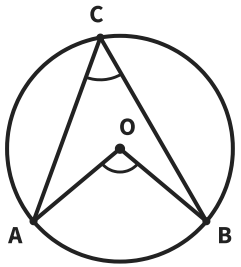
x is at the circumference, so halve

84° ÷ 2 = 42°

x = 42°

11

O is the centre. Angle AOB = $(3x + 10)°$ and angle ACB = $(x + 20)°$. Find the value of x.



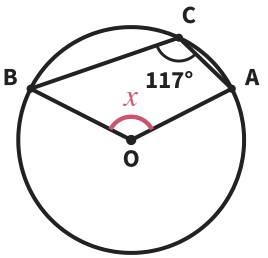
3x + 10 = 2(x + 20)

3x + 10 = 2x + 40, so x = 30

x = 30

12

O is the centre.
Find angle AOB, marked x.



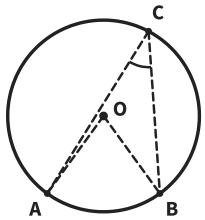
reflex AOB = 2 × 117° = 234°

x = 360° − 234° = 126°

x = 126°

13

A round garden has a fountain at its centre O. Lamps A, B and C stand on the edge. From lamp C, the angle between lamps A and B is 36°.
Find the angle between A and B seen from the fountain.

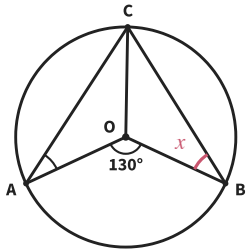


angle AOB = 2 × 36°

Answer 72°

14

O is the centre. Angle AOB = 130° and angle OAC = 32°.
Find angle OBC, marked x.



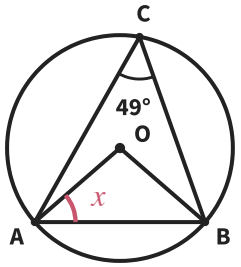
ACB = 65° and OCA = 32° (OA = OC)

OCB = 33°, and OB = OC, so x = 33°

x = 33°

15

O is the centre of the circle.
Find angle OAB, marked x.
Give your reasons.



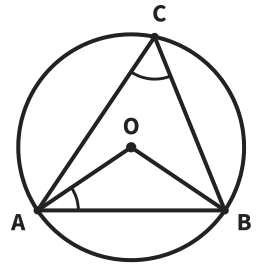
AOB = 2 × 49° = 98°

OA = OB, so x = (180° − 98°) ÷ 2

x = 41°

16

O is the centre and O is inside triangle ABC. Explain why angle OAB + angle ACB is always 90°.



Let ACB = y, so AOB = 2y

OA = OB, so OAB = (180° − 2y) ÷ 2

OAB = 90° − y, so the sum is 90°