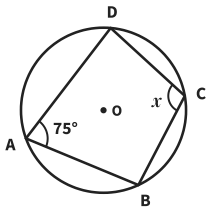
Circle Theorems: Cyclic Quadrilaterals

ANSWERS

1

ABCD is a cyclic quadrilateral. Find x.



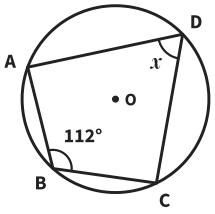
$x + 75 = 180$

Reason Opposite angles in a cyclic quadrilateral add up to 180°.

$x =$ 105°

2

ABCD is a cyclic quadrilateral. Find x.



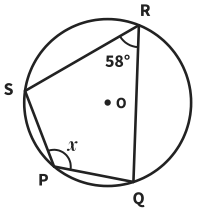
$x + 112 = 180$

Reason Opposite angles in a cyclic quadrilateral add up to 180°.

$x =$ 68°

3

PQRS is a cyclic quadrilateral. Find x.



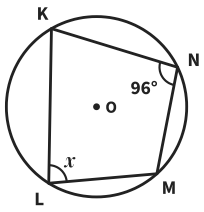
$x + 58 = 180$

Reason Opposite angles in a cyclic quadrilateral add up to 180°.

$x =$ 122°

4

KLMN is a cyclic quadrilateral. Find x.



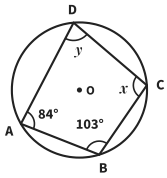
$x + 96 = 180$

Reason Opposite angles in a cyclic quadrilateral add up to 180°.

$x =$ 84°

5

ABCD is a cyclic quadrilateral.
Find x and y.



$x = 180 - 84$

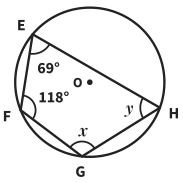
$y = 180 - 103$

Reason Opposite angles in a cyclic quadrilateral add up to 180°.

$x =$ 96°, y = 77°

6

EFGH is a cyclic quadrilateral.
Find x and y.



$x = 180 - 69$

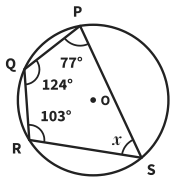
$y = 180 - 118$

Reason Opposite angles in a cyclic quadrilateral add up to 180°.

$x =$ 111°, y = 62°

7 Notice the change!

PQRS is a cyclic quadrilateral. Find x.



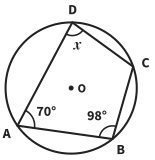
$x = 180 - 124$

Reason Opposite angles in a cyclic quadrilateral add up to 180°.

$x =$ 56°

8

ABCD is a cyclic quadrilateral.
Ria says $x = 180 - 70 = 110°$.
Explain her mistake and find x.



70° is next to x, not opposite it.

$x = 180 - 98$

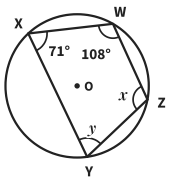
$x =$ 82°

Circle Theorems: Cyclic Quadrilaterals *further practice*

ANSWERS

9

WXYZ is a cyclic quadrilateral.
Find x and y.



$x = 180 - 71$

$y = 180 - 108$

Answer $x = 109°, y = 72°$

10

The angles of a quadrilateral, in order, are 72°, 96°, 108° and 84°. Can all four corners lie on a circle? Explain.

72 + 108 = 180 and 96 + 84 = 180

opposite angles add up to 180°

Answer Yes

11

Three angles of a cyclic quadrilateral, in order, are 64°, 118° and 116°.
Find the fourth angle.

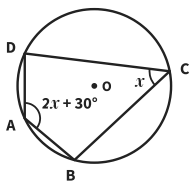
the fourth is opposite 118°

180 − 118 = 62

Answer 62°

12

ABCD is a cyclic quadrilateral. Find x.



$2x + 30 + x = 180$

$3x = 150$

$x =$ $x = 50$

13

Four lamp posts A, B, C and D stand on the edge of a round pond, in that order.
Angle DAB is twice angle BCD.
Find angle BCD.

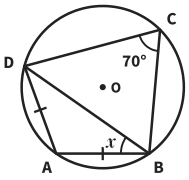
angle DAB + angle BCD = 180

x + 2x = 180, 3x = 180

Answer 60°

14

ABCD is a cyclic quadrilateral with AB = AD. Angle BCD = 70°.
Find angle ABD, marked x.



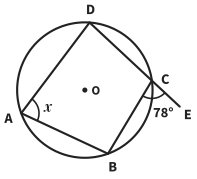
angle BAD = 180 − 70 = 110°

(180 − 110) ÷ 2 = 35 (isosceles)

Answer 35°

15

ABCD is a cyclic quadrilateral.
DC is carried on to E. Angle BCE = 78°.
Find x.



angle BCD = 180 − 78 = 102° (on a line)

x = 180 − 102 (opposite angles)

$x =$ $x = 78°$

16

Two opposite angles of a cyclic quadrilateral are equal. Find their size.
Explain how you know.

they add up to 180°

so each is 180 ÷ 2 = 90°

So both 90°