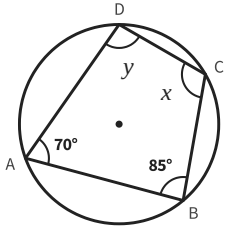


Circle Theorems: Cyclic Quadrilaterals

ANSWERS

1 opposite angles add to 180°

Find x and y .



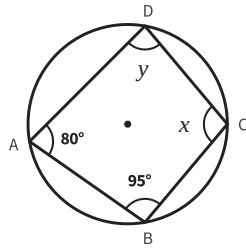
$$x = 180 - 70 = 110$$

• opposite angles add to 180°

$$y = 180 - 85 = 95$$

• opposite angles add to 180°

2 Find x and y .



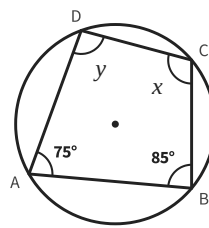
$$x = 180 - 80 = 100$$

• opposite angles add to 180°

$$y = 180 - 95 = 85$$

• opposite angles add to 180°

3 Find x and y .



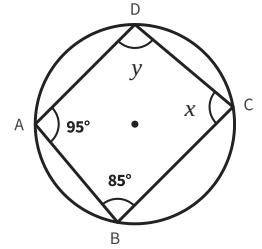
$$x = 180 - 75 = 105$$

• opposite angles add to 180°

$$y = 180 - 85 = 95$$

• opposite angles add to 180°

4 Find x and y .



$$x = 180 - 95 = 85$$

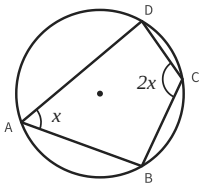
• opposite angles add to 180°

$$y = 180 - 85 = 95$$

• opposite angles add to 180°

5 Notice the change!

Find x .

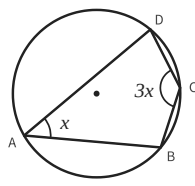


$$x + 2x = 180 \text{ (opposite angles)}$$

$$3x = 180$$

$$x = 60^\circ$$

6 Find x .

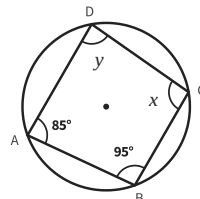


$$x + 3x = 180 \text{ (opposite angles)}$$

$$4x = 180$$

$$x = 45^\circ$$

7 Find x and y .

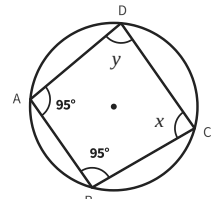


$$x = 180 - 85$$

$$y = 180 - 95$$

$$x = 95^\circ \quad y = 85^\circ$$

8 Find x and y .



$$x = 180 - 95$$

$$y = 180 - 95$$

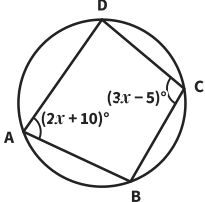
$$x = 85^\circ \quad y = 85^\circ$$

Circle Theorems: Cyclic Quadrilaterals further practice

ANSWERS

9

ABCD is a cyclic quadrilateral. Find the value of x .



$$(2x + 10) + (3x - 5) = 180$$

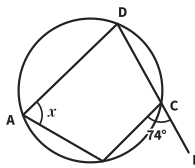
$$5x + 5 = 180$$

$$x = 35$$

Answer

10

ABCD is a cyclic quadrilateral. DC is extended to E. Find angle BAD, marked x .



$$\text{angle } BCD = 180 - 74 = 106^\circ \text{ (straight line)}$$

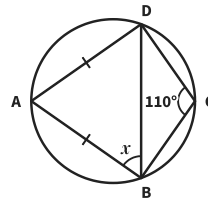
$$x = 180 - 106 \text{ (opposite angles)}$$

$$x = 74^\circ$$

Answer

11

ABCD is a cyclic quadrilateral with $AB = AD$. Find angle ABD, marked x .



$$\text{angle } BAD = 180 - 110 = 70^\circ \text{ (opposite angles)}$$

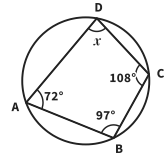
$$x = (180 - 70) \div 2$$

$$x = 55^\circ$$

Answer

12

A table top has four straight sides and its corners lie on a circle. Three of its angles, in order round the table, are 72° , 97° and 108° . Find the fourth angle, x .



$$72^\circ \text{ and } 108^\circ \text{ are opposite: } 72 + 108 = 180$$

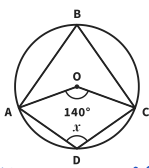
$$x \text{ is opposite } 97^\circ: x = 180 - 97$$

$$x = 83^\circ$$

Answer

13

Four flags A, B, C and D stand on the edge of a round ice rink with centre O. Angle AOC = 140° . Find angle ADC, marked x .



$$\text{angle } ABC = 140 \div 2 = 70^\circ \text{ (angle at the centre)}$$

$$x = 180 - 70 \text{ (opposite angles)}$$

$$x = 110^\circ$$

Answer

14

A logo is a quadrilateral ABCD with its four corners on a circle. Its angles A, B, C and D are in the ratio $2 : 3 : 7 : k$. Find k .

$$A + C = 180: 9 \text{ parts} = 180^\circ, \text{ so } 1 \text{ part} = 20^\circ$$

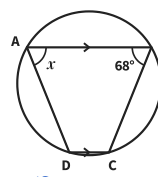
$$B = 60^\circ, \text{ so } D = 120^\circ = 6 \text{ parts}$$

$$k = 6$$

Answer

15

ABCD is a cyclic quadrilateral and AB is parallel to DC. Find angle BAD, marked x .



$$\text{angle } ADC = 180 - 68 = 112^\circ \text{ (opposite angles)}$$

$$x = 180 - 112 \text{ (co-interior angles)}$$

$$x = 68^\circ$$

Answer

16

Explain why a parallelogram can only have all four corners on a circle if it is a rectangle.

a parallelogram's opposite angles are equal on a circle opposite angles add to 180° , so each is 90°

every angle is 90°

So