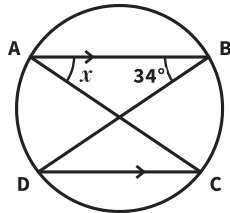


Circle Theorems: Angles in the Same Segment *stretch*

ANSWERS

1

AB is parallel to DC. Find angle BAC, marked x .



Not drawn accurately

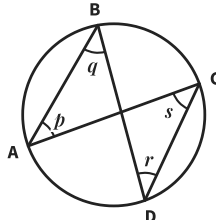
$$\text{angle } BDC = 34^\circ \text{ (alternate angles)}$$

$$x = \text{angle } BDC \text{ (angles in the same segment)}$$

Answer $x = 34^\circ$

2

A, B, C and D are on the circle. Which of the marked angles are equal? Give a reason.



Not drawn accurately

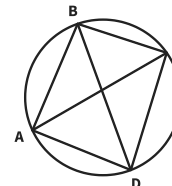
$$p \text{ and } r \text{ both stand on the chord } BC; q \text{ and } s \text{ both stand on } AD$$

$$\text{angles in the same segment are equal}$$

Answer $p = r \text{ and } q = s$

3

Ravi says angle BAC = angle BDC, angle ABD = angle ACD and angle BAD = angle BCD. Which one is wrong? Explain.



Not drawn accurately

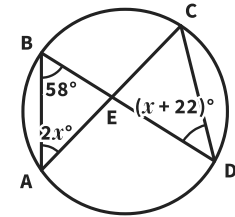
$$BAD \text{ and } BCD \text{ are opposite angles of the cyclic quadrilateral } ABCD$$

$$\text{they add to } 180^\circ; \text{ they are not in the same segment}$$

Answer $BAD = BCD \text{ is wrong}$

4

Chords AC and BD cross at E. Find the value of x , then angle AEB.



Not drawn accurately

$$2x = x + 22 \text{ (angles in the same segment),}$$

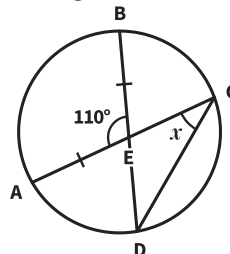
$$x = 22$$

$$AEB = 180 - 44 - 58 = 78^\circ \text{ (triangle ABE)}$$

Answer $x = 22, AEB = 78^\circ$

5

Chords AC and BD cross at E, and EA = EB. Find angle ACD, marked x .



Not drawn accurately

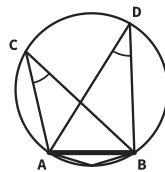
$$EAB = EBA = (180 - 110) \div 2 = 35^\circ \text{ (EA = EB)}$$

$$x = \text{angle } ABD = 35^\circ \text{ (angles in the same segment)}$$

Answer $x = 35^\circ$

6

Friends at C, D and F on the edge of a round pond look at a straight jetty AB. Angle ACB = $(2y + 4)^\circ$ and angle ADB = $(3y - 11)^\circ$. Find angle AFB.



Not drawn accurately

$$2y + 4 = 3y - 11 \text{ (same segment): } y = 15,$$

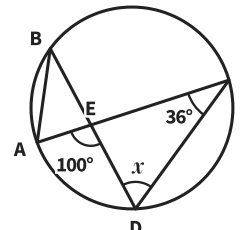
$$\text{so } ACB = 34^\circ$$

$$ACBF \text{ is cyclic: } AFB = 180 - 34 = 146^\circ$$

Answer $AFB = 146^\circ$

7

Chords AC and BD cross at E. Find angle BDC, marked x .



Not drawn accurately

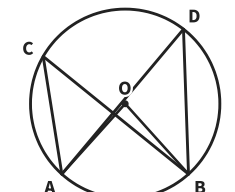
$$AEB = 80^\circ \text{ (straight line), } ABD = 36^\circ \text{ (same segment as ACD)}$$

$$BAC = 180 - 80 - 36 = 64^\circ; x = BAC \text{ (same segment)}$$

Answer $x = 64^\circ$

8

O is the centre. Use the angle at the centre theorem to explain why angle ACB = angle ADB.



$$ACB = \frac{1}{2} AOB \text{ (angle at the centre)}$$

$$ADB = \frac{1}{2} AOB \text{ too, so } ACB = ADB$$

Reason $\text{both} = \frac{1}{2} AOB$