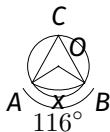


Push Tasks — Answers



1. Find x , then the base angles.



Solution

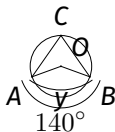
$$x = 116 \div 2 = 58^\circ$$

$\triangle OAB$:

$$2 \times \text{base} + 116 = 180$$

Base angles = 32°
each

2. Find y , then the base angles.



Solution

$$y = 140 \div 2 = 70^\circ$$

$\triangle OAB$:

$$2 \times \text{base} + 140 = 180$$

Base angles = 20°
each

3. A centre angle is $(5x - 8)^\circ$, and the same-arc circumference angle is $(2x + 10)^\circ$. Find x .

Solution

$$5x - 8 = 2(2x + 10)$$

$$x = 28$$

4. Tangent at P ; radius OP ; chord PQ with $OP = OQ$; $\angle OQP = 34^\circ$. Find the angle between the tangent and PQ .

Solution

$\triangle OPQ$ isosceles: $\angle OPQ = 34^\circ$

Tangent-radius = 90°

$$\text{Angle} = 90 - 34 = 56^\circ$$

Push Tasks — Answers



5. A cyclic quadrilateral has angles $x^\circ, 95^\circ, 65^\circ, y^\circ$ in order around the circle. Find x and y .

Solution

$$x + 65 = 180 \Rightarrow x = 115$$

$$95 + y = 180 \Rightarrow y = 85$$

7. In a circle, centre angle $AOC = 140^\circ$. $ABCD$ is a cyclic quadrilateral, B on the major arc. Find $\angle ABC$, then $\angle ADC$.

Solution

$$\angle ABC = 140 \div 2 = 70^\circ$$

$$\angle ADC = 180 - 70 = 110^\circ$$

6. A cyclic quadrilateral has one angle 128° . Its two adjacent angles are equal to each other. Find those two angles.

Solution

Adjacent pair is opposite each other, so they sum to 180°

Equal $\Rightarrow 90^\circ$ each

8. In a circle, cyclic quadrilateral $ABCD$ has $\angle ADC = 118^\circ$, B on the major arc. Find $\angle ABC$, then centre angle $\angle AOC$.

Solution

$$\angle ABC = 180 - 118 = 62^\circ$$

$$\angle AOC = 2 \times 62 = 124^\circ$$

Push Tasks — Answers



9. A student says: “The centre angle is 150° , so the same-arc circumference angle is 85° .” Explain the error and give the correct answer.

Solution

Circumference = centre $\div 2$, not
centre $- 65$

Correct: $150 \div 2 = 75^\circ$

11. A cyclic quadrilateral has equal opposite angles, x° and x° . A student says this is only possible if $x = 90$. Is the student correct? Explain.

Solution

Correct: opposite angles sum to 180°
 $x + x = 180 \Rightarrow x = 90$ always

10. A student says a 100° angle can stand in a semicircle. Explain why this is impossible.

Solution

The angle in a semicircle is
always exactly 90° (Thales),
so 100° is impossible

12. Explain how the tangent-radius, semicircle, and cyclic-quadrilateral theorems are all connected by right angles in circle geometry.

Solution

Tangent-radius = 90° always. A diameter's 180°
centre angle halves to 90° . Opposite arcs' 360°
halves to a 180° angle sum.