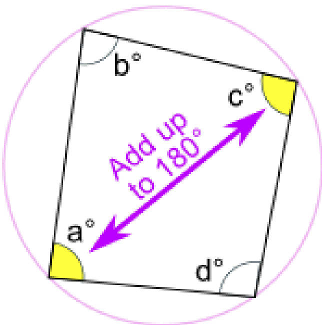
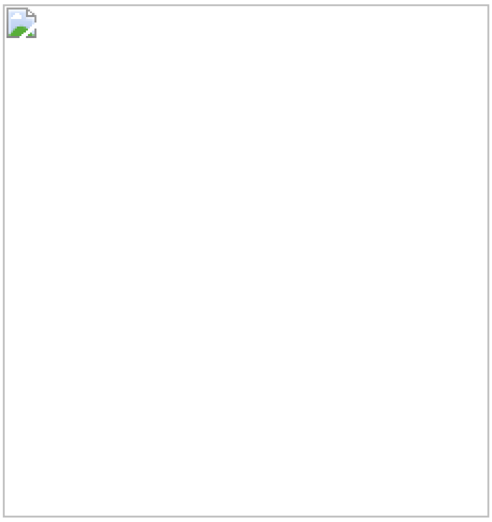
NCERT Class 9 Solutions: Circles (Chapter 10) Exercise 10.5 – Part 1



Q-1 In the figure, P, Q and R are three points on a circle with center O such that $\angle QOR = 30^\circ$ and $\angle POQ = 60^\circ$. If S is a point on the circle other than the arc PQR, find $\angle PSR$.



Solution:

Given,

- P, Q, R are three points on a circle
- Its center is O
- Also, $\angle QOR = 30^\circ$ and $\angle POQ = 60$

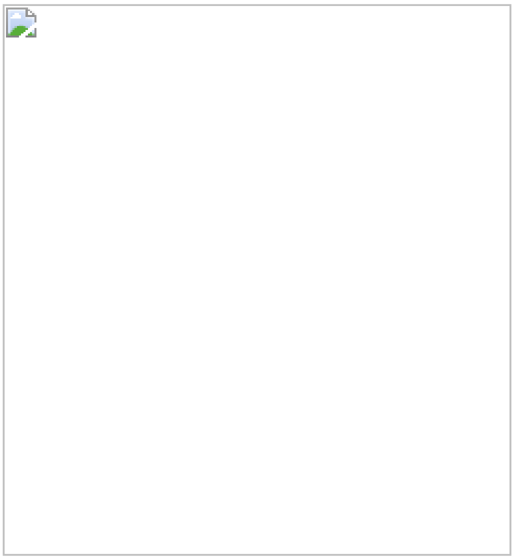
Now,

- $\angle POR = \angle POQ + \angle QOR$
- $\angle POR = 60^\circ + 30^\circ$ ($\angle QOR = 30^\circ$ and $\angle POQ = 60$)
- $\angle POR = 90^\circ$

We know angle subtend by an arc at the center is double the angle subtended by the same arch at the any point on the remaining part of the circle.

Therefore, $\angle PSR = \frac{1}{2}\angle POR = \frac{1}{2} \times 90^\circ = 45^\circ$

Q-2 A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc and at a point on the major arc.



Solution:

Given, PR is equal to the radius of the circle.

- In ΔOPR , $OP =$ OR $= PR =$ Radius of the circle.
- Thus, ΔOPR is an equilateral triangle, and, $\angle POR = 60°$

Since angle subtended by an arc at any point on the remainder of the circle is half the angle subtended by the same arc at the center. Therefore, ∠ PQR = $\frac{1}{2}$ ∠ POR =

$$\frac{1}{2} \times 60° = 30° \left(\because \angle POR = 60°\right)$$

Since, PQRD is a cyclic quadrilateral,

- $\angle PQR + \angle PDR = 180°$ (Opposite angles of cyclic quadrilateral)
- $\angle PDR = 180° - 30° = 150°$ ($\because \angle PQR = 30°$)
- Thus the angles subtended by the chord with length equal to the radius are $150°$ on major arc and $30°$ on minor arc.