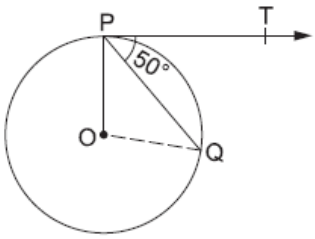
MCQ

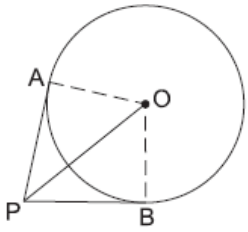
1. In the given figure, O is the centre of a circle, PQ is a chord and the tangent PT at P makes an angle of 50° with PQ. Then, $\angle POQ = ?$



   (a) 130° (b) 100°
   (c) 90° (d) 75°

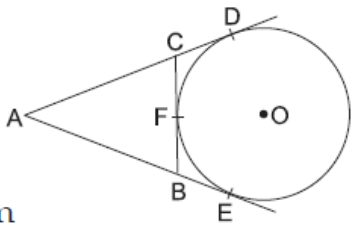
2. If the angle between two radii of a circle is 130° then the angle between the tangents at the ends of the radii is
   (a) 65° (b) 40° (c) 50° (d) 90°

3. If tangents PA and PB from a point P to a circle with centre O are drawn so that $\angle APB = 80°$ then $\angle POA = ?$



   (a) 40° (b) 50°
   (c) 80° (d) 60°

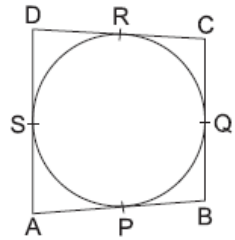
4. In the given figure, AD and AE are the tangents to a circle with centre O and BC touches the circle at F. If $AE = 5$ cm then perimeter of ΔABC is



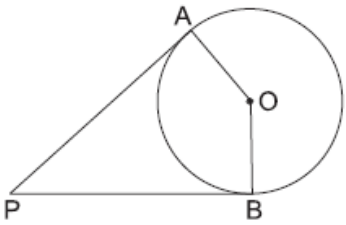
   (a) 15 cm (b) 10 cm
   (c) 22.5 cm (d) 20 cm

Short-Answer Questions

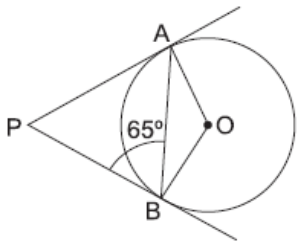
5. In the given figure, a quadrilateral $ABCD$ is drawn to circumscribe a circle such that its sides AB, BC, CD and AD touch the circle at P, Q, R and S respectively. If $AB = x$ cm, $BC = 7$ cm, $CR = 3$ cm and $AS = 5$ cm, find x.



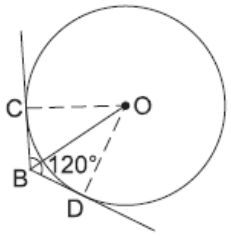
6. In the given figure, PA and PB are the tangents to a circle with centre O. Show that the points A, O, B, P are concyclic.



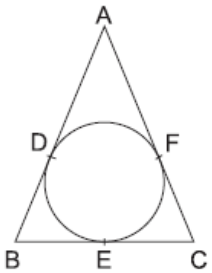
7. In the given figure, PA and PB are two tangents from an external point P to a circle with centre O. If $\angle PBA = 65°$, find $\angle OAB$ and $\angle APB$.



8. Two tangent segments BC and BD are drawn to a circle with centre O such that $\angle CBD = 120°$. Prove that $OB = 2BC$.



9. Fill in the blanks.
   (i) A line intersecting a circle in two distinct points is called a ..... .
   (ii) A circle can have ..... parallel tangents at the most.
   (iii) The common point of a tangent to a circle and the circle is called the ..... .
   (iv) A circle can have ..... tangents.
10. Prove that the lengths of two tangents drawn from an external point to a circle are equal.
11. Prove that the tangents drawn at the ends of the diameter of a circle are parallel.
12. In the given figure, if $AB = AC$, prove that $BE = CE$.



13. If two tangents are drawn to a circle from an external point, show that they subtend equal angles at the centre.
14. Prove that the tangents drawn at the ends of a chord of a circle make equal angles with the chord.

15. Prove that the parallelogram circumscribing a circle, is a rhombus.
16. Two concentric circles are of radii 5 cm and 3 cm respectively. Find the length of the chord of the larger circle which touches the smaller circle.

Long-Answer Questions

17. A quadrilateral is drawn to circumscribe a circle. Prove that the sums of opposite sides are equal.
18. Prove that the opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.
19. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segments joining the points of contact at the centre.
20. PQ is a chord of length 16 cm of a circle of radius 10 cm. The tangents at P and Q intersect at a point T as shown in the figure. Find the length of TP.