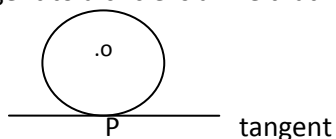


X Chapter Tangent of Circle BY JSUNIL TUTORIAL

Questions Bank for CBSE EXAMS

Tangent to a circle : A tangent to a circle is a line that intersect the circle at only one point.

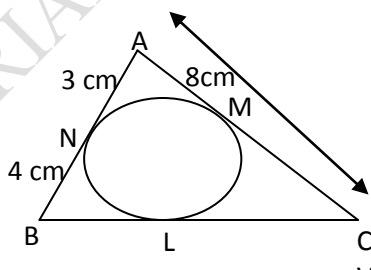


P= point of contact

- There is only one tangent at a point on a circle.
- There are exactly two tangents to a circle through a point lying outside the circle.
- The tangent at any point of a circle is perpendicular to the radius through the point of contact.
- The length of tangents drawn from an external point to a circle are equal.

(1 Mark Questions)

1. If radii of the two concentric circles are 15cm and 17cm , then find the length of each chord of one circle which is tangent to one other. Ans. 16cm
2. If two tangents making an angle of 120° with each other , are drawn to a circle of radius 6cm, then find the angle between the two radii, which are drawn to the tangents. Ans. 60°
3. In the adjoining figure , ΔABC is circumscribing a circle , then find the length of BC. Ans. 9cm

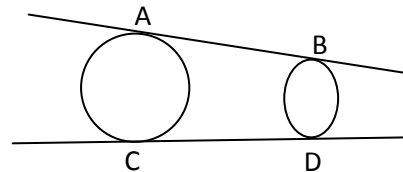


4. PQ is a chord of a circle and R is point on the minor arc. If PT is a tangent at point P such that $\angle QPT = 60^\circ$ then find $\angle PRQ$. Ans. 120°
5. If a tangent PQ at a point P of a circle of radius 5cm meets a line through the centre O at a point Q such that OQ = 12 cm then find the length of PQ. Ans. $\sqrt{119}$ cm
6. From a point P, two tangents PA and PB are drawn to a circle C(O,r) . If $OP = 2r$,then what is the type of ΔAPB . Ans. Equilateral triangle
7. If the angle between two radii of a circle is 130° , then find the angle between the tangents at the end of the radii. Ans. 50° .
8. ABCD is a quadrilateral. A circle centred at O is inscribed in the quadrilateral. If AB = 7cm , BC = 4cm , CD = 5cm then find DA. Ans. 8 cm

9. In a ΔABC , $AB = 8\text{cm}$, $\angle ABC = 90^\circ$. Then find the radius of the circle inscribed in the triangle.
 Ans. 2cm

(Two Marks Questions)

1. Two tangents PA and PB are drawn from an external point P to a circle with centre O. Prove that OAPB is a cyclic quadrilateral.
2. If PA and PB are two tangents drawn to a circle with centre O, from an external point P such that $PA=5\text{cm}$ and $\angle APB = 60^\circ$, then find the length of the chord AB. Ans. 5cm
3. CP and CQ are tangents from an external point C to a circle with centre O. AB is another tangent which touches the circle at R and intersects PC and QC at A and B respectively. If $CP = 11\text{cm}$ and $BR = 4\text{cm}$, then find the length of BC. Ans. 7cm
4. If all the sides of a parallelogram touch a circle, show that the parallelogram is a rhombus.
5. Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre of the circle.
6. In adjacent figure; AB & CD are common tangents to two circles of unequal radii. Prove that $AB=CD$.



(Three Marks Questions)

1. If quadrilateral ABCD is drawn to circumscribe a circle then prove that $AB+CD=AD+BC$.
2. Prove that the angle between the two tangents to a circle drawn from an external point, is supplementary to the angle subtended by the line segment joining the points of contact to the centre.
3. AB is a chord of length 9.6cm of a circle with centre O and radius 6cm. If the tangents at A and B intersect at point P then find the length PA. Ans. 8cm
4. The incircle of a ΔABC touches the sides BC, CA & AB at D, E and F respectively. If $AB=AC$, prove that $BD=CD$.
5. Prove that the intercept of a tangent between two parallel tangents to a circle subtends a right angle at the centre of the circle
6. PQ and PR are two tangents drawn to a circle with centre O from an external point P. Prove that $\angle QPR=2\angle OQR$.

(Four Marks Questions)

1. Prove that the length of tangents drawn from an external point to a circle is equal. Hence, find BC, if a circle is inscribed in a ΔABC touching AB, BC & CA at P, Q & R respectively, having AB=10cm, AR=7cm & RC=5cm. Ans. 8cm
2. Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact. Using the above, do the following: If O is the centre of two concentric circles, AB is a chord of the larger circle touching the smaller circle at C, then prove that AC=BC.
3. A circle touches the side BC of a ΔABC at a point P and touches AB and AC when produced, at Q & R respectively. Show that $AQ = \frac{1}{2}$ (perimeter of ΔABC).
4. From an external point P, a tangent PT and a line segment PAB is drawn to circle with centre O, ON is perpendicular to the chord AB. Prove that $PA \cdot PB = PN^2 - AN^2$.
5. If AB is a chord of a circle with centre O, AOC is diameter and AT is the tangent at the point A, then prove that $\angle BAT = \angle ACB$.
6. The tangent at a point C of a circle and diameter AB when extended intersect at P. If $\angle PCA = 110^\circ$, find $\angle CBA$. Ans. 70°

[Self Evaluation/HOTS Questions]

1. If PA and PB are tangents from an external point P to the circle with centre O, the find $\angle AOP + \angle OPA$. Ans. 90°
2. ABC is an isosceles triangle with AB=AC, circumscribed about a circle . Prove that the base is bisected by the point of contact.
3. AB is diameter of a circle with centre O. If PA is tangent from an external point P to the circle with $\angle POB = 115^\circ$ then find $\angle OPA$. Ans. 25°
4. PQ and PR are tangents from an external point P to a circle with centre O. If $\angle RPQ = 120^\circ$, Prove that $OP = 2PQ$.
5. If the common tangents AB and CD to two circles $C(O, r)$ and $C'(O', r')$ intersect at E, then prove that $AB = CD$.
6. If a, b, c are the sides of a right triangle where c is the hypotenuse , then prove that radius r of the circle touches the sides of the triangle is given by $r = (a+b-c)/2$.