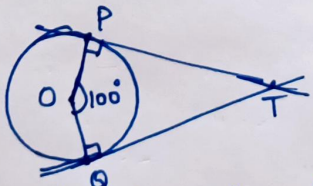
10. Circles

4 Marks:

1) Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre
2) Prove that the parallelogram circumscribing a circle is a rhombus.
3) Prove that the tangents drawn at the ends of a diameter of a circle are parallel
4) Prove that the lengths of tangents are drawn from an external point to a circle are equal.
5) Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact.
6) Prove that in two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.
7) Prove that the opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.
8) A quadrilateral ABCD is drawn to circumscribe a circle prove that $AB+CD = AD+BC$
9) Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$.
10) 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 segment joining the points of contact at the centre.

2 Marks:

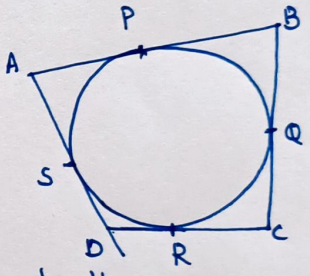
1) Calculate the length of tangent from a point 15cm away from the centre of a circle of radius 9cm.
2) Two concentric circles of radii 5cm and 3cm. Find the length of the chord of the larger circle which touches smaller circle.
3) The length of a tangent from a point A at a distance 5cm from the center of the circle is 4cm. Find the radius of the circle.
4) The distance between two tangents parallel to each other of a circle is 8cm. Find the radius of the circle.
5) Draw a circle and two lines parallel to a given line such that one is a tangent and the other is secant to a circle.
6) A tangent PQ at a point P of a circle of radius 5cm meets a line through the centre 'O' at a point Q, show that $OQ = 12$cm, find length of PQ.
7) PQ is a chord of length 8cm of a circle of radius 5cm. The tangents at P and Q intersect at a point T. Find the length TP.
8) Find the length of a tangent from a point 15cm away from the centre of the circle of radius 5cm?
9) From a point Q, the length of the tangent to a circle is 24cm and the distance of Q from the centre is 25cm. Find the radius of the circle.
10) Find the length of the tangent from a point 10cm away from the centre of a circle of radius 6cm.
11) In the figure if TP and TQ are the two tangents to a circle with centre 'O' that $\angle POQ = 100°$. Find the $\angle PTQ$



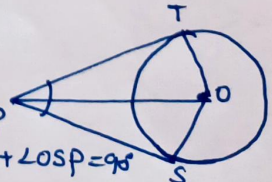
12) Calculate the length of tangent from a point 10cm away from the centre of a circle of radius 5cm.
13) If TP and TQ are the two tangents to a circle with centre 'O' so that $\angle POQ = 110°$ then find $\angle PTQ$.

1 Mark:

1) How many tangents can a circle have?
2) The length of tangents drawn from an external point to a circle are ——
3) How many tangents can be drawn to a circle from an external point?
4) The angle between radius and tangent at the point of contact is ——
5) The distance between two parallel tangents of a circle is 18cm, then the radius of the circle is ——
6) A line intersecting a circle in two points is called ——
7) The rectangle circumscribing a circle is a ——
8) If two tangents inclined at an angle 60° are drawn to a circle of radius 3cm, then length of each tangent is equal to —— cm
9) In the given figure, a circle touches all the four sides of quadrilateral ABCD with AB = 6cm, BC = 7cm, CD = 4cm then length of AD = ——



10) A circle can have —— parallel tangents at the most
11) What is the name of the parallelogram circumscribing a circle?
12) How many number of common tangents can be drawn to two concentric circles.
13) Define Tangent?
14) Define Secant?
15) From the adjacent figure, which of the following is false?



A) $\angle OTP = 90°$ B) $\angle OSP = 90°$ C) $PT = PS$ D) $\angle OTP + \angle OSP = 90°$

16) Name the point where the tangent touches the circle.
17) What is a limit of a secant of a circle?
18) How many secants can be drawn to a circle?

19) How many tangents can be drawn to a circle from a point inside a circle?

20) Draw rough diagrams of
   i) Tangent to a circle
   ii) Secant to a circle.

21) How many tangents can be drawn to a circle from a point on the circle?

22) What is the length of tangent drawn to a circle with radius 'r' from a point 'p' which is 'd' units away from the centre?

23) Draw a pair of tangents to a circle from an external point.

24) From the figure, find $\angle PAQ$