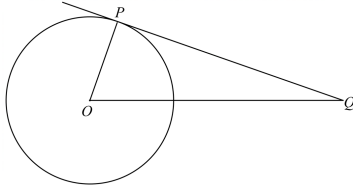


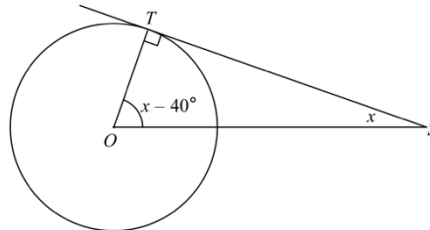
# Circles

## 1 Mark

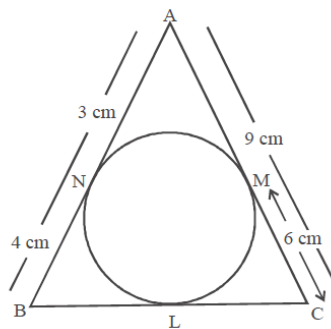
1. In figure  $PQ$  is a tangent to a circle with centre  $O$ . What is the measure of  $\angle OPQ$ ?



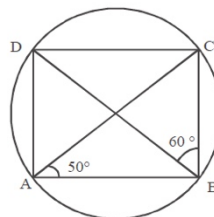
2.  $PQ$  and  $PR$  are the tangents from the external point  $P$ . If the sum of length of  $PQ$  and  $PR$  is 12.4cm. what is the length of  $PR$ ?
3. The length of tangent  $PQ$  from external point  $P$  is 24cm. If the distance of point  $P$  from the centre is 25cm. What is the diameter of the circle?
4. In figure what is the value of  $x$ ?



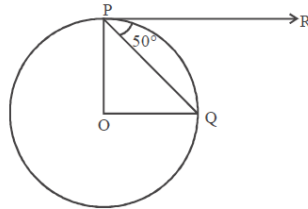
5. In fig.,  $\triangle ABC$  is circumscribing a circle. Find the length of  $BC$ .



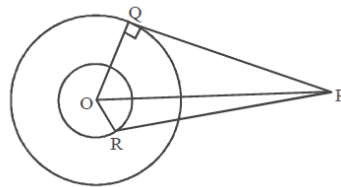
7. The length of the tangent to a circle from a point  $P$ , which is 25 cm away from the centre, is 24 cm. What is the radius of the circle.
8. In fig.,  $ABCD$  is a cyclic quadrilateral. If  $\angle BAC = 50^\circ$  and  $\angle DBC = 60^\circ$ , then find  $\angle BCD$ .



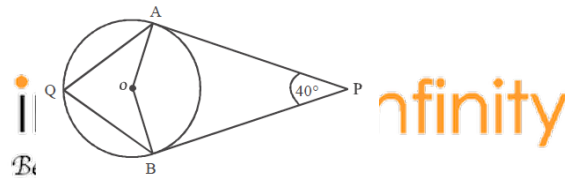
9. In figure,  $O$  is the centre of a circle,  $PQ$  is a chord and the tangent  $PR$  at  $P$  makes an angles of  $50^\circ$  with  $PQ$ . Find  $\angle POQ$ .



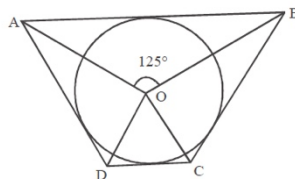
10. If two tangents inclined at an angle  $60^\circ$  are drawn to a circle of radius 3 cm, then find the length of each tangent.
11. If radii of two concentric circles are 4 cm and 5 cm, then find the length of each chord of one circle which is tangent to the other circle.
12. In the given figure, PQ is tangent to outer circle and PR is tangent to inner circle. If  $PQ = 4\text{cm}$ ,  $OQ = 3\text{ cm}$  and  $QR = 2\text{ cm}$  then find the length of PR.



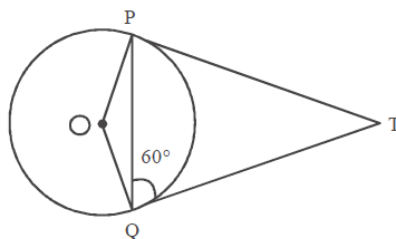
13. In the given figure, O is the centre of the circle, PA and PB are tangents to the circle then find  $\angle AQB$ .



14. In the given figure, If  $\angle AOB = 125^\circ$  then find  $\angle COD$ .

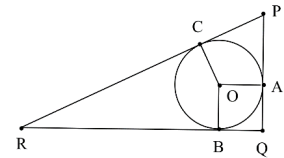


15. If two tangent TP and TQ are drawn from an external point T such that  $\angle TQP = 60^\circ$  then find  $\angle OPQ$ .

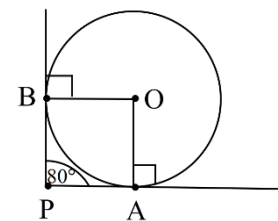


## 2/3/4 Marks

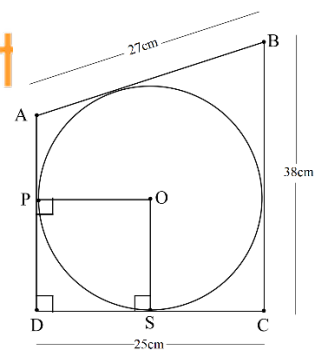
1. A tangent PQ at a point P of a circle of radius 5cm meets a line through the Centre O at a point Q so that OQ = 12cm. Find the length PQ. [Ans :  $\sqrt{119}cm$ ]
2. In two concentric circles, prove that a chord of a larger circle which is tangent to smaller circle is bisected at the point of contact.
3. 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. [Ans : 7cm]
4. PQR is a right-angled triangle at Q with QR = 12cm and PQ = 5cm. A circle with Centre O is inscribed in  $\Delta PQR$ . Find the radius of the circle. [Ans : 2cm]



5. If tangents PA and PB from a point P to a circle with Centre O are inclined to each other at an angle of  $80^\circ$ , then find the angle  $\angle POA$ . [Ans :  $50^\circ$ ]



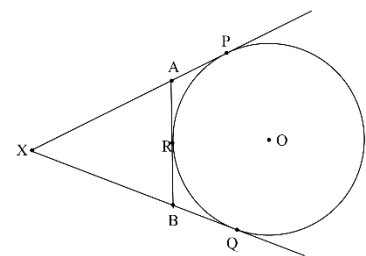
6. Prove that the perpendicular at the point of contact to the tangent to a circle passes through the Centre.
7. Two concentric circles are of radii 5cm and 3cm. Find the length of the chord of the larger circle which touches the smaller circle. [Ans : 8cm]
8. In given fig. a circle is inscribed in a quadrilateral ABCD. If BC = 38cm, BQ = 27cm, DC = 25cm and  $AD \perp DC$ . Find the radius of the circle. [Ans : 14cm]



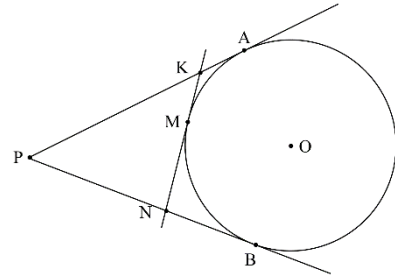
9. Two tangent segments BC, BD are drawn to a circle C(O, r) such that  $\angle DBC = 120^\circ$ . Prove that  $BO = 2 BC$ .
10. If  $\Delta ABC$  is isosceles with  $AB = AC$  and C(O, r) is the in-circle of  $\Delta ABC$  touching BC at L. Prove that the point L bisects BC.
11. The incircle of  $\Delta ABC$  touches the sides BC, CA and AB at D, E and F respectively. Show that

$$AF + BD + CE = AE + BF + CD = \frac{1}{2} \text{Perimeter of } \Delta ABC.$$

12. In fig XP and XQ are tangents from X to the circle with centre O. R is a point on the circle such that ARB is tangent to the circle. Prove that  $XA + AR = XB + BR$ .



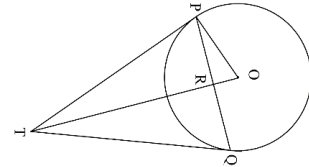
13. PA and PB are tangents from P and to a circle with centre O. At the point M, a tangent is drawn cutting PA at K and PB at N. Prove that  $KN = AK + BN$ .



14. The radius of the incircle of the triangle is 4cm and the segments into which one side is divided by the point of contact are 6cm and 8cm. Determine the other two sides of the triangle.

[Ans :13cm,15cm]

15. The radii of two concentric circles are 13cm and 8 cm. AB is a diameter of the bigger circle. BD is a tangent to the smaller circle touching it at D. Find length of AD. [Ans :19cm]



16. In given figure, 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 length of TP.

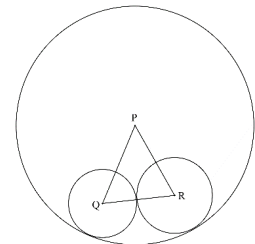
[Ans :6.67cm]

17. Two tangents TP and TQ are drawn to a circle with Centre O from an external point T. Prove that  $\angle PTQ = 2\angle OPQ$ .

18. A circle touches the side BC of  $\triangle ABC$  at P, and touches AB and AC produced at Q and R respectively, as shown in figure. Show that  $AQ = \frac{1}{2}(\text{perimeter of } \triangle ABC)$ .

19. Prove that there is one and only one tangent at any point on the circumference of a circle.

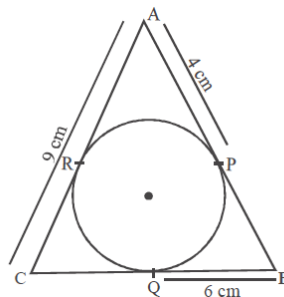
20. In given fig three circles with Centre P, Q and R are drawn such that the circles With centre Q and R touches each other externally and the touch the circle With centre P internally.  $PQ = 10\text{cm}$ ,  $PR = 8\text{cm}$  and  $QR = 12\text{cm}$  then find The diameter of largest circle. [Ans :30cm]



21. If diameters of two concentric circle are  $d_1$  and  $d_2$  ( $d_2 > d_1$ ) and  $C$  is the length of chord of bigger circle which is tangent to the smaller circle. Show  $d_2^2 = C^2 + d_1^2$

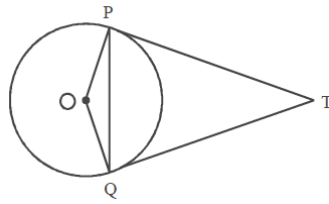
22. The length of tangent to a circle of radius 2.5 cm from an external point P is 6 cm. Find the distance of P from the nearest point of the circle.

23. In the given fig.  $AP = 4\text{ cm}$ ,  $BQ = 6\text{ cm}$  and  $AC = 9\text{ cm}$ . Find the semi perimeter of  $\triangle ABC$

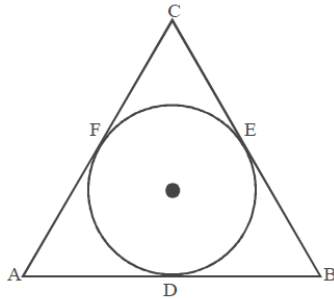


24. A circle is drawn inside a right angle triangle whose sides are a, b, c where c is the hypotenuse, which touches all the sides of the triangle. Prove that  $r = \frac{a+b-c}{2}$  where r is the radius of the circle.

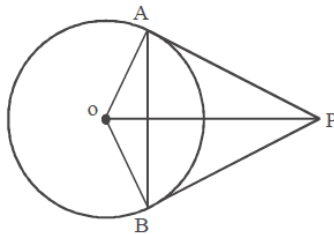
25. In the given fig. PQ is a chord of length 6 cm and the radius of the circle is 6 cm. TP and TQ are two tangents drawn from an external point T. Find  $\angle PTQ$ .



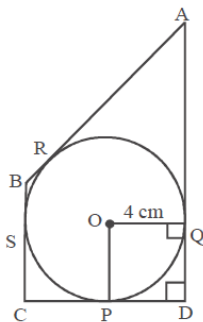
26. In the given figure find AD, BE, CF where AB = 12 cm, BC = 8 cm and AC = 10cm



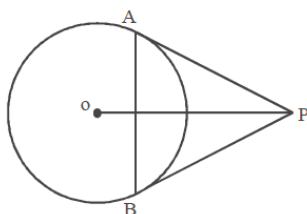
27. In a right triangle ABC a circle is drawn with AB as the diameter which intersect hypotenuse AC at point P. Prove  $PB = PC$ .
28. In the given fig. OP is equal to the diameter of the circle with centre O. Prove that  $\triangle ABP$  is an equilateral triangle.



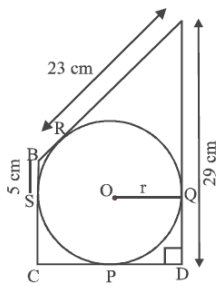
29. In the given fig., Find PC.



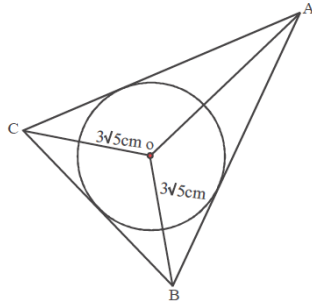
30. In a circle with center O, AB is a diameter and AC is the chord and  $\angle BAC = 30^\circ$ . A tangent AB drawn at the point C when extended meets D. Prove  $BC = BD$ .
31. In the given fig. PA and PB are tangents to the circle with center O. Prove that OP bisects AB and is perpendicular to it.



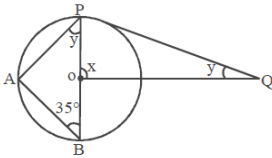
32. In the given fig. find the radius of the circle.



33. In the given fig. if radius of circle is 3 cm. Find the perimeter of  $\Delta ABC$ .



34. In the given fig. PQ is tangent and PB is diameter. Find the value of x and y.



**Answers**

**1 Mark**

1.  $90^\circ$
2. 6.2 cm
3. 14 cm
4.  $65^\circ$
5. 10 cm
6. 7 cm
7.  $70^\circ$
8.  $100^\circ$
9.  $3\sqrt{3}cm$
10. 6 cm
11.  $\sqrt{21}cm$
12.  $70^\circ$
13.  $55^\circ$
14.  $30^\circ$

**2/3/4 Marks**

1.  $\sqrt{119}cm$

2. 7 cm
4. 2 cm
5.  $50^\circ$
7. 8 cm
8. 14 cm
14. 13 cm, 15cm
15. 19 cm
16. 6.67 cm
20. 30 cm
22. 4 cm
23. 15 cm
25.  $120^\circ$
26. AD = 7 cm, BE = 5 cm, CF = 3 cm
29. 5 cm
32. 11 cm
33. 32 cm
34. X =  $35^\circ$ , y =  $55^\circ$

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