

- Q1.** What is the distance between two parallel tangents to a circle of radius 5 cm?
- Q2.** What is the distance between two parallel tangents of a circle of radius 4 cm?
- Q3.** A point P is 26 cm away from the centre O of a circle and the length PT of the tangent drawn from P to the circle is 10 cm. Find the radius of the circle.
- Q4.** Find the length of a tangent drawn to a circle with radius 5 cm, from a point 13 cm from the centre of the circle.
- Q5.** If PT is a tangent at T to a circle whose centre is O and $OP = 17$ cm, $OT = 8$ cm. Find the length of the tangent segment PT .
- Q6.** Find the length of the tangent drawn from a point whose distance from the centre of a circle is 25 cm. Given that the radius of the circle is 7 cm.
- Q7.** A point P is 13 cm from the centre of the circle. The length of the tangent drawn from P to the circle is 12 cm. Find the radius of the circle.
- Q8.** If the tangent at a point P to a circle with centre O cuts a line through O at Q such that $PQ = 24$ cm and $OQ = 25$ cm. Find the radius of the circle.
- Q9.** O is the centre of a circle of radius 8 cm. The tangent at a point A on the circle cuts a line through O at B such that $AB = 15$ cm. Find OB .
- Q10.** A line through the centre O of a circle of radius 7 cm cuts the tangent, at a point P on the circle, at Q such that $PQ = 24$ cm. Find OQ .
- Q11.** ABC is a right angled triangle, right angled at B such that $BC = 6$ cm and $AB = 8$ cm. A circle with centre O is inscribed in $\triangle ABC$. The radius of the circle is
- (a) 1 cm (b) 2 cm (c) 3 cm (d) 4 cm
- Q12.** Two equal circles touch each other externally at C and AB is a common tangent to the circles. Then $\angle ACB =$
- (a) 60° (b) 45° (c) 30° (d) 90°
- Q13.** PQ is a tangent to a circle with centre O at the point P . If $\triangle OPQ$ is an isosceles triangle, then $\angle OQP$ is equal to
- (a) 30° (b) 45° (c) 60° (d) 90°
- Q14.** The length of the tangent from a point A to a circle, of radius 3 cm, is 4 cm. The distance of A from the centre of the circle is
- (a) $\sqrt{7}$ cm (b) 7 cm (c) 5 cm (d) 25 cm
- Q15.** A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q such that $OQ = 12$ cm. Length PQ is
- (a) 12 cm (b) 13 cm (c) 8.5 cm (d) $\sqrt{119}$ cm
- Q16.** PQ is a tangent drawn from a point P to a circle with centre O and QOR is a diameter of the circle such that $\angle POR = 120^\circ$, then $\angle OPQ$ is
- (a) 60° (b) 45° (c) 30° (d) 90°

Q17. If four sides of a quadrilateral $ABCD$ are tangential to a circle, then

- (a) $AC + AD = BD + CD$ (b) $AB + CD = BC + AD$
 (c) $AB + CD = AC + BC$ (d) $AC + AD = BC + DB$

Q18. The length of the tangent drawn from a point 8 cm away from the centre of a circle of radius 6 cm is

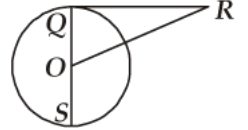
- (a) $\sqrt{7}$ cm (b) $2\sqrt{7}$ cm (c) 10 cm (d) 5 cm

Q19. AB and CD are two common tangents to circles which touch each other at C . If D lies on AB such that $CD = 4$ cm, then AB is equal to

- (a) 4 cm (b) 6 cm (c) 8 cm (d) 12 cm

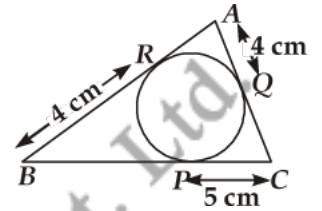
Q20. In figure, RQ is a tangent to the circle with centre O . If $SQ = 6$ cm and $QR = 4$ cm, then $OR =$

- (a) 8 cm (b) 3 cm (c) 2.5 cm (d) 5 cm



Q21. In figure, the perimeter of ΔABC is

- (a) 30 cm (b) 60 cm
 (c) 45 cm (d) 15 cm



Q22. If PT is tangent drawn from a point P to a circle touching it at T and O is the centre of the circle, then $\angle OPT + \angle POT =$

- (a) 30° (b) 60° (c) 90° (d) 180°

Q23. At one end of a diameter PQ of a circle of radius 5 cm, tangent XPY is drawn to the circle. The length of chord AB parallel to XY and at a distance of 8 cm from P is

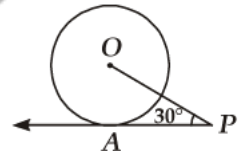
- (a) 5 cm (b) 6 cm (c) 7 cm (d) 8 cm

Q24. AP and PQ are tangents drawn from a point A to a circle with centre O and radius 9 cm. If $OA = 15$ cm, then $AP + AQ =$

- (a) 12 cm (b) 18 cm (c) 24 cm (d) 36 cm

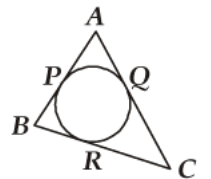
Q25. In figure, AP is a tangent to the circle with centre O such that $OP = 4$ cm and $\angle OPA = 30^\circ$. Then, $AP =$

- (a) $2\sqrt{2}$ cm (b) 2 cm (c) $2\sqrt{3}$ cm (d) $3\sqrt{2}$ cm



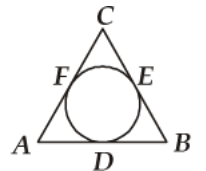
Q26. In figure, if $AP = PB$, then

- (a) $AC = AB$ (b) $AC = BC$
 (c) $AQ = QC$ (d) $AB = BC$



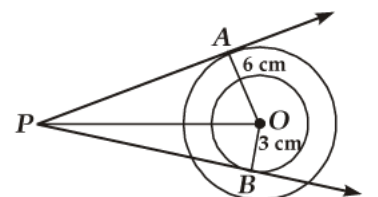
Q27. In the adjacent figure, if $AB = 12$ cm, $BC = 8$ cm and $AC = 10$ cm, then $AD =$

- (a) 5 cm (b) 4 cm
 (c) 6 cm (d) 7 cm



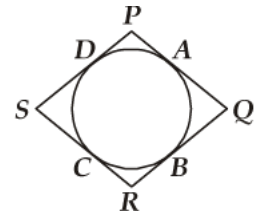
Q28. In figure, if $AP = 10$ cm, then $BP =$

- (a) $\sqrt{91}$ cm (b) $\sqrt{127}$ cm
 (c) $\sqrt{119}$ cm (d) $\sqrt{109}$ cm



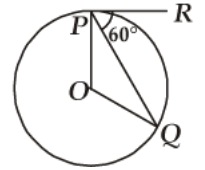
Q29. In figure, if quadrilateral $PQRS$ circumscribes a circle, then $PD + QB =$

- (a) PQ (b) QR
 (c) PR (d) PS



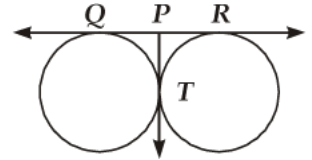
Q30. In figure, if PR is tangent to the circle at P and Q is the centre of the circle, then $\Delta POQ =$

- (a) 110° (b) 100°
 (c) 120° (d) 90°



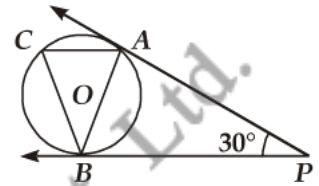
Q31. In figure, two equal circles touch each other at T . If $QP = 4.5$ cm, then $QR =$

- (a) 9 cm (b) 18 cm
 (c) 15 cm (d) 13.5 cm



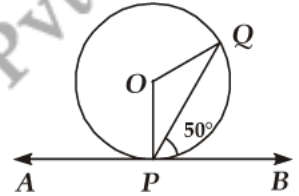
Q32. In figure, if tangents PA and PB are drawn to a circle such that $\angle APB = 30^\circ$ and chord AC is drawn parallel to the tangent PB , $\angle ABC =$

- (a) 60° (b) 90°
 (c) 30° (d) None of these



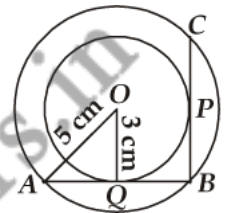
Q33. In figure, APB is a tangent to a circle with centre O at point P . If $\angle QPB = 50^\circ$, then the measure of $\angle POQ$ is

- (a) 100° (b) 120°
 (c) 140° (d) 150°



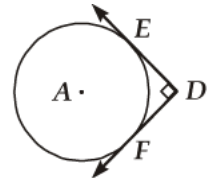
Q34. Two concentric circles of radii 3 cm and 5 cm are given. Then of chord BC which touches the inner circle at P is equal to

- (a) 4 cm (b) 6 cm
 (c) 8 cm (d) 10 cm



Q35. In figure, DE and DF are tangents from an external point D to a circle with centre A . If $DE = 5$ cm and $DE \perp DF$, then the radius of the circle is

- (a) 3 cm (b) 5 cm
 (c) 4 cm (d) 6 cm



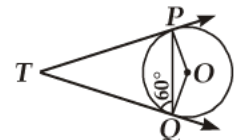
Q36. In figure, a circle touches the side DF of ΔEDF at H and touches ED and EF produced at K and M respectively. If $EK = 9$ cm, then the perimeter of ΔEDF is

- (a) 18 cm (b) 14.5 cm (c) 12 cm (d) 9 cm



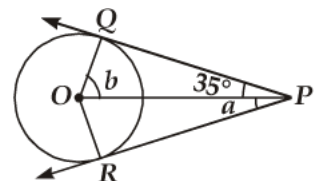
Q37. In figure, if TP and TQ are tangents drawn from an external point T to a circle with centre O such that $\angle TQP = 60^\circ$, then $\angle OPQ =$

- (a) 25° (b) 30° (c) 40° (d) 60°



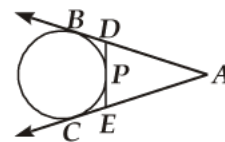
Q38. In figure, PQ and PR are tangents drawn from P to a circle with centre O . If $\angle OPQ = 35^\circ$, then

- (a) $a = 30^\circ, b = 60^\circ$ (b) $a = 35^\circ, b = 55^\circ$
 (c) $a = 40^\circ, b = 50^\circ$ (d) $a = 45^\circ, b = 45^\circ$



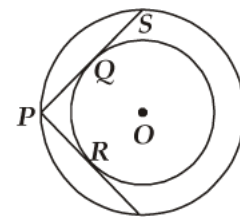
Q39. In figure, if $AB = 8$ cm and $PE = 3$ cm, then $AE =$

- (a) 11 cm (b) 7 cm
(c) 5 cm (d) 3 cm



Q40. In figure, there are two concentric circles with centre O . PR and PQS are tangents to the inner circle from point P lying on the outer circle. If $PR = 7.5$ cm, then PS is equal to

- (a) 10 cm (b) 12 cm
(c) 15 cm (d) 18 cm



Q41. Two circles touch each other externally at P . AB is a common tangent to the circle touching them at A and B . The value of $\angle APB$ is

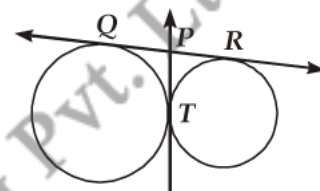
- (a) 30° (b) 45° (c) 60° (d) 90°

Q42. In a right triangle ABC , right angled at B , $BC = 12$ cm and $AB = 5$ cm. The radius of the circle inscribed in the triangle (in cm) is

- (a) 4 (b) 3 (c) 2 (d) 1

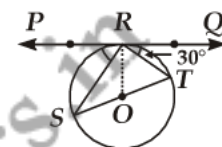
Q43. In figure, QR is a common tangent to the given circles touching externally at the point T . The tangent at T meets QR at P . If $PT = 3.8$ cm, then the length of QR (in cm) is

- (a) 3.8 (b) 7.6
(c) 5.7 (d) 1.9



Q44. In two concentric circles, a chord of length 24 cm of larger circle becomes a tangent to the smaller circle whose radius is 5 cm. Find the radius of the larger circle.

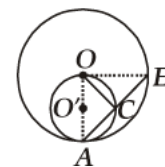
Q45. In figure, PQ is tangent at a point R of the circle with centre O . If $\angle TRQ = 30^\circ$, find $m\angle PRS$.



Q46. If the sides of a quadrilateral touch a circle, prove that the sum of a pair of opposite sides is equal to the sum of the other pair.

Q47. In two concentric circles, prove that all chords of the outer circle which touch the inner are of equal length.

Q48. In figure, circles $C(O, r)$ and $C(O', r/2)$ touch internally at a point A and B is a chord of the circle $C(O, r)$ intersecting $C(O', r/2)$ at C . Prove that $AC = AB$.

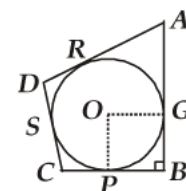


Q49. If PA and PB are tangents from an outside point P , such that $PA = 10$ cm and $\angle APB = 60^\circ$. Find the length of chord AB .

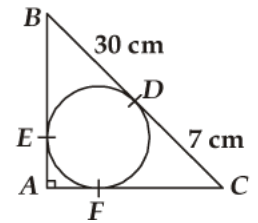
Q50. If ΔABC is isosceles with $AB = AC$ and $C(O, r)$ is the incircle of the ΔABC touching BC at L , prove that L bisects BC .

Q51. Two circles touch externally at a point P . From a point T on the tangent at P , tangents TQ and TR are drawn to the circles with points of contact Q and R respectively. Prove that $TQ = TR$.

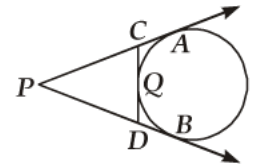
Q52. In figure, a circle is inscribed in a quadrilateral $ABCD$ in which $\angle B = 90^\circ$. If $AD = 23$ cm, $AB = 29$ cm and $DS = 5$ cm, find the radius r of the circle.



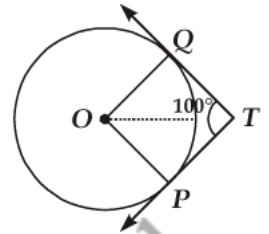
- Q53.** In figure, BDC is a tangent to the given circle at point D such that $BD = 30$ cm and $CD = 7$ cm. The other tangents BD and CF are drawn respectively from B and C to the circle and meet when produced at A making BAC a right angle triangle. Calculate (i) AF (ii) radius of the circle.



- Q54.** In figure, PA and PB are tangents to the circle drawn from an external point P . CD is a third tangent touching the circle at Q . If $PB = 10$ cm and $CQ = 2$ cm, what is the length PC ?

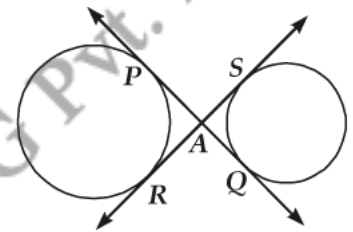


- Q55.** Two tangents TP and TQ are drawn from an external point T to a circle with centre O as shown in figure. If they are inclined to each other at an angle of 100° , then what is the value of POQ ?

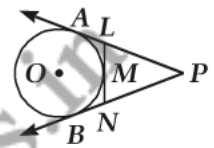


- Q56.** Two concentric circles are of diameters 30 cm and 18 cm. Find the length of the chord of the larger circle which touches the smaller circle.

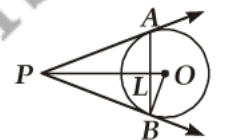
- Q57.** In figure, common tangents PQ and RS to two circles intersect at A . Prove that $PQ = RS$.



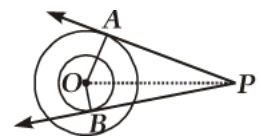
- Q58.** In figure, PA and PB are tangents from an external point P to a circle with centre O . LN touches the circle at M . Prove that $PL + LM = PN + MN$.



- Q59.** In figure, AB is a chord of length 16 cm of a circle of radius 10 cm. The tangents at A and B intersect at a point P . Find the length of PA .



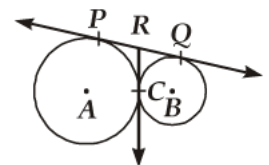
- Q60.** In figure, there are two concentric circles with centre O of radii 5 cm and 3 cm. From an external point P , tangents PA and PB are drawn to these circles. If $AP = 12$ cm, find the length of BP .



- Q61.** Prove that the segment joining the points of contact of two parallel tangents passes through the centre.

- Q62.** In two concentric circles, prove that a chord of larger circle which is tangent to smaller circle is bisected at the point of contact.

- Q63.** In figure, two circles touch each other at the point C . Prove that the common tangent to the circles at C , bisects the common tangent at P and Q .



- Q64.** Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

- Q65.** The length of tangent from a point A at a distance of 5 cm from the centre of the circle is 4 cm. What is the radius of the circle?

- Q66.** Prove that, if two tangents are drawn to a circle from an external point, then:
- they subtend equal angles at the centre,
 - they are equally inclined to the segment, joining the centre to that point.

- Q67.** In figure, the incircle of $\triangle ABC$ touches the sides BC, CA and AB at D, E and F respectively. Show that

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



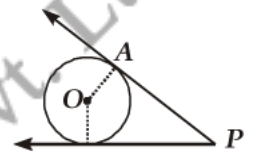
- Q68.** PA and PB are tangents from P to the circle with centre O . At point M , a tangent is drawn cutting PA at K and PB at N . Prove that $KN = AK + BN$.

- Q69.** $ABCD$ is a quadrilateral such that $\angle D = 90^\circ$. A circle $C(O, r)$ touches the sides AB, BC, CD and DA at P, Q, R and S respectively. If $BC = 48$ cm, $CD = 25$ cm and $BP = 27$ cm, find r .

- Q70.** Prove that the tangents at the extremities of any chord make equal angles with the Chord.

- Q71.** The radii of two concentric circles are 13 cm and 8 cm. AB is a diameter of the bigger circle. BD is a tangent to the smaller circle touching it at D . Find the length AD .

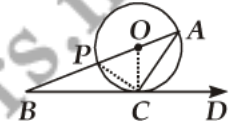
- Q72.** In figure, O is the centre of the circle. PA and PB are tangent segments. Show that the quadrilateral $AOBP$ is cyclic.



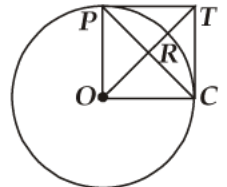
- Q73.** If an isosceles triangle ABC in which $AB = AC = 6$ cm is inscribed in a circle of radius 9 cm, find the area of the triangle.

- Q74.** From an external point P , tangents PA and PB are drawn to a circle with centre O . If CD is the tangent to the circle at a point E and $PA = 14$ cm, find the perimeter of $\triangle PCD$.

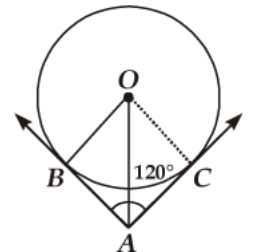
- Q75.** In figure, O is the centre of the circle and BCD is tangent to it at C . Prove that $\angle BAC + \angle ACD = 90^\circ$.



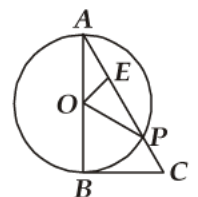
- Q76.** In figure, $PO \perp QO$. The tangents to the circle at P and Q intersect at a point T . Prove that PQ and OT are bisectors of each other.



- Q77.** In figure, two tangents AB and AC are drawn to a circle with centre O such that $\angle BAC = 120^\circ$. Prove that $OA = 2AB$.

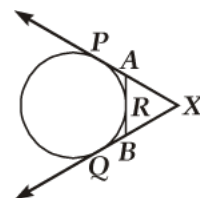


- Q78.** In figure, BC is a tangent to the circle with centre O . OE bisects AP . Prove that $\triangle AEO \sim \triangle ABC$.



- Q79.** The lengths of three consecutive sides of a quadrilateral circumscribing a circle are 4 cm, 5 cm and 7 cm respectively. Determine the length of the fourth side.

- Q80.** In figure, XP and XQ are tangents from X to the circle with centre O . R is a point on the circle. Prove that, $XA + AR = XB + BR$.

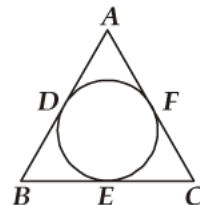


- Q81.** A circle is touching the side BC of $\triangle ABC$ at P and touching AB and AC produced at Q and R respectively. Prove that $AQ = \frac{1}{2}$ (Perimeter of $\triangle ABC$).

- Q82.** In figure, if $AB = AC$, prove that $BE = EC$.

Or

ABC is an isosceles triangle in which $AB = AC$, circumscribed about a circle, as shown in figure. Prove that the base is bisected by the point of contact.

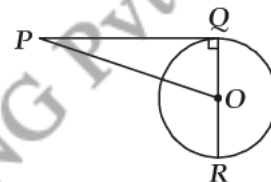


- Q83.** Prove that the lengths of two tangents drawn from an external point to a circle are equal.

- Q84.** Prove that a line drawn through the end point of a radius and perpendicular to it is a tangent to the circle.

- Q85.** Prove that a tangent to a circle is perpendicular to the radius through the point of contact.

- Q86.** In figure, $OQ : PQ = 3 : 4$ and perimeter of $\triangle POQ = 60$ cm. Determine PQ , QR and OP .



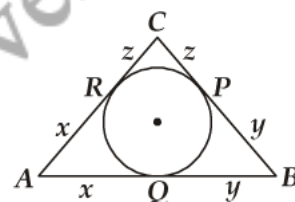
- Q87.** A circle touches all the four sides of a quadrilateral $ABCD$. Prove that: $AB + CD = BC + DA$.

- Q88.** If all the side of a parallelogram touch a circle, show that the parallelogram is a rhombus.

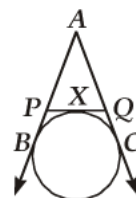
Or

Prove that a parallelogram circumscribing a circle is a rhombus.

- Q89.** A circle is inscribed in a $\triangle ABC$ having sides 8 cm, 10 cm and 12 cm as shown in figure. Find AD , BE and CF .



- Q90.** If AB , AC , PQ are tangents in figure and $AB = 5$ cm, find the perimeter of $\triangle APQ$.

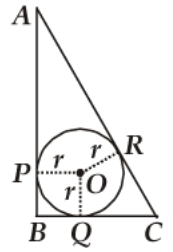


- Q91.** Two tangents TP and TQ are drawn to a circle with centre O from an external point T . Prove that $\angle PTQ = 2 \angle OPQ$.

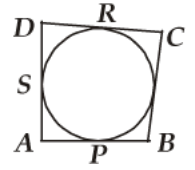
- Q92.** From an external point P , two tangent PA and PB are drawn to the circle with centre O . Prove that OP is the perpendicular bisector of AB .

- Q93.** Two tangent segments PA and PB are drawn to a circle with centre O such that $\angle APB = 120$. Prove that $OP = 2AP$.

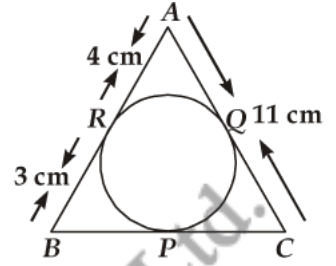
Q94. In figure, ABC is a right triangle right-angled at B such that $BC = 6$ cm and $AB = 8$ cm. Find the radius of its incircle.



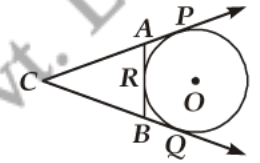
Q95. In figure, a circle touches all the four sides of a quadrilateral $ABCD$ with $AB = 6$ cm, $BC = 7$ cm and $CD = 4$ cm. Find AD .



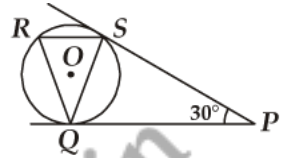
Q96. In figure, ΔABC is circumscribing a circle. Find the length of BC .



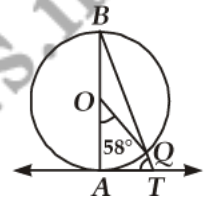
Q97. In figure, CP and CQ are tangents to a circle with centre O . ARB is another tangent touching the circle at R . If $CP = 11$ cm and $BC = 7$ cm, then find the length of BR .



Q98. In figure, tangents PQ and PR are drawn from an external point P to a circle with centre O , such that $\angle RPQ = 30^\circ$. A chord RS is drawn parallel to the tangent PQ . Find $\angle RQS$.

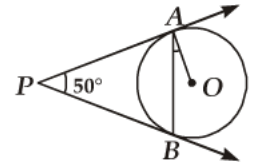


Q99. In figure, AB is a diameter of a circle with centre O and AT is a tangent. If $\angle AOQ = 58^\circ$, find $\angle ATQ$.

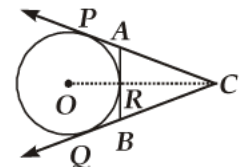


Q100 A triangle PQR is drawn to circumscribe a circle of radius 8 cm such that the segments QT and TR , into which QR is divided by the point of contact T , are of lengths 14 cm and 16 cm respectively. If area of ΔPQR is 336 cm², find the sides PQ and PR .

Q101 In figure, PA and PB are tangents to the circle with centre O such that $\angle APB = 50^\circ$. Write the measure of $\angle OAB$.



Q102 In figure, AP 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 . If $CP = 11$ cm and $BR = 4$ cm, find the length of BC .



Q103 In figure, the sides AB , BC and CA of triangle ABC touch a circle with centre O and radius r at P , Q and R respectively.

- (i) $AB + CQ = AC + BQ$ (ii) $\text{Area}(\Delta ABC) = \frac{1}{2} (\text{Perimeter of } \Delta ABC) \times r$



Q104 From a point P , two tangents PA and PB are drawn to a circle with centre O . If $OP =$ diameter of the circle, show that ΔAPB is equilateral.

Q105 AB is a diameter of a circle. P is a point on the semi-circle APB . AH and BK are perpendiculars from A and B respectively to the tangent at P . Prove that $AH + BK = AB$.

Q106 Two circles with centre A and B of radii 3 cm and 4 cm respectively intersect at two points C and D such that AC and BC are lengths to the two circles. Find the length of the common chord CD .

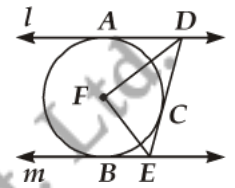
Q107 Prove that the intercept of a tangent between two parallel tangents to a circle subtends a right angle at the centre.

Q108 O is the centre of a circle of radius 5 cm. T is a point such that $OT = 13$ cm and OT intersects the circle at E . If AB is the tangent to the circle at E , find the length of AB .

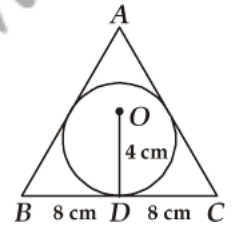
Q109 The radius of the incircle of a triangle is 4 cm and the segments into which one side is divided by the point of contact are 6 cm and 8 cm. Determine the other two sides of the triangle.

Q110 PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T . Find the length TP .

Q111 In figure, l and m are two parallel tangents at A and B . The tangent at C makes an intercept FE between l and m . Prove that $\angle DEF = 90^\circ$.



Q112 In figure, a $\triangle ABC$ is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC are of lengths 8 cm and 6 cm respectively. Find the lengths of sides AB and AC , when area of $\triangle ABC$ is 84 cm^2 .



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- S1.** 10 cm.
- S2.** ????
- S3.** Radius of the circle is 24 cm.
- S4.** 12 cm.
- S5.** Length of the tangent segment $PT = 15$ cm.
- S6.** Length of the tangent from $P = 24$ cm.
- S7.** Radius of the circle is 5 cm.
- S8.** Radius of the circle = 7 cm.
- S9.** $OB = 17$ cm.
- S10.** $OQ = 25$ cm.
- S11.** (b) 2 cm.
- S12.** (d) 90° .
- S13.** (b) 45° .
- S14.** (c) 5 cm.
- S15.** (d) $\sqrt{119}$ cm.
- S16.** (c) 30° .
- S17.** (b) $AB + CD = BC + AD$.
- S18.** (b) $2\sqrt{7}$ cm.
- S19.** (c) 8 cm..
- S20.** (d) 5 cm.
- S21.** (a) 30 cm.
- S22.** (c) 90° .
- S23.** (d) 8 cm..
- S24.** (c) 24 cm.
- S25.** (c) $2\sqrt{3}$ cm.

- S26. (b)** $AC = BC$.
- S27. (d)** 7 cm.
- S28. (b)** $\sqrt{127}$.
- S29. (a)** PQ .
- S30. (c)** 120° .
- S31. (a)** 9 cm.
- S32. (c)** 30° .
- S33. (a)** 100° .
- S34. (c)** 8 cm.
- S35. (a)** 3 cm.
- S36. (a)** 18 cm.
- S37. (b)** 30° .
- S38. (b)** $a = 35^\circ, b = 55^\circ$.
- S39. (c)** 5 cm.
- S40. (c)** 15 cm.
- S41. (d)** 90° .
- S42. (c)** 2.
- S43. (b)** 7.6.
- S44.** The radius of the smaller circle is 13 cm.
- S45.** $m \angle PRS = 60^\circ$.
- S46.** Proved.
- S47.** Proved.
- S48.** Proved.
- S49.** Length of chord $AB = 10$ cm.
- S50.** Proved.
- S51.** Proved.
- S52.** 11 cm.
- S53. (i)** $AF = 5$ cm, **(ii)** Radius of the circle is 5 cm.
- S54.** The length $PC = 8$ cm.

- S55.** The value of $POQ = 80^\circ$.
- S56.** 24 cm.
- S57.** Proved.
- S58.** Proved.
- S59.** The length of $PA = \frac{40}{3}$ cm .
- S60.** The length of $BP = 4\sqrt{10}$ cm .
- S61.** Proved.
- S62.** Proved.
- S63.** Proved.
- S64.** 8 cm.
- S65.** The radius of the circle = 3 cm.
- S66.** Proved.
- S67.** Proved.
- S68.** Proved.
- S69.** $r = 14$ cm.
- S70.** Proved.
- S71.** The length of $AD = 19$ cm.
- S72.** Proved.
- S73.** The area of the triangle is $8\sqrt{2}$ cm² .
- S74.** The perimeter of $\Delta PCD = 28$ cm.
- S75.** Proved.
- S76.** Proved.
- S77.** Proved.
- S78.** Proved.
- S79.** Length of the fourth side is 6 cm.
- S80.** Proved.
- S81.** Proved.
- S82.** Proved.

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- S83.** Proved.
- S84.** Proved.
- S85.** Proved.
- S86.** $PQ = 20$ cm, $QR = 30$ cm and $OP = 25$ cm.
- S87.** Proved.
- S88.** Proved.
- S89.** $AD = x = 7$ cm, $BE = y = 5$ cm and $CF = z = 3$ cm.
- S90.** The perimeter of $\Delta APQ = 10$ cm.
- S91.** Proved.
- S92.** Proved.
- S93.** Proved.
- S94.** Radius of its incircle = 2 cm.
- S95.** $AD = 3$ cm.
- S96.** Length of $BC = 10$ cm.
- S97.** Length of $BR = 4$ cm.
- S98.** $\angle RQS = 75^\circ$.
- S99.** $\angle ATQ = 61^\circ$.
- S100**????
- S101**The measure of $\angle OAB = 25^\circ$.
- S102**Length of $BC = 7$ cm.
- S103**Proved.
- S104**.Proved.
- S105**.Proved.
- S106**.Length of $CD = 4.8$ cm.
- S107**.Proved.
- S108**.The length of $AB = \frac{20}{3}$ cm .
- S109**Other two sides are 15 cm and 13 cm.
- S110**The length of TP is $\frac{20}{3}$ cm .
- S111**Proved.

S112 Lengths of sides $AB = 13$ cm and $AC = 15$ cm.

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