MATHS

BOOKS - RS AGGARWAL MATHS (HINGLISH)

CIRCLES

Solved Examples

1. From a point P, $10cm$ away from the centre of a circle, a tangent PT of length $8cm$ is

drawn. Find the radius of the circle.

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2. 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 $OQ = 13cm$. Find the length of PQ.

A. 12 cm

B. 7 cm

C. 10 cm

D. 15 cm

Answer: A

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

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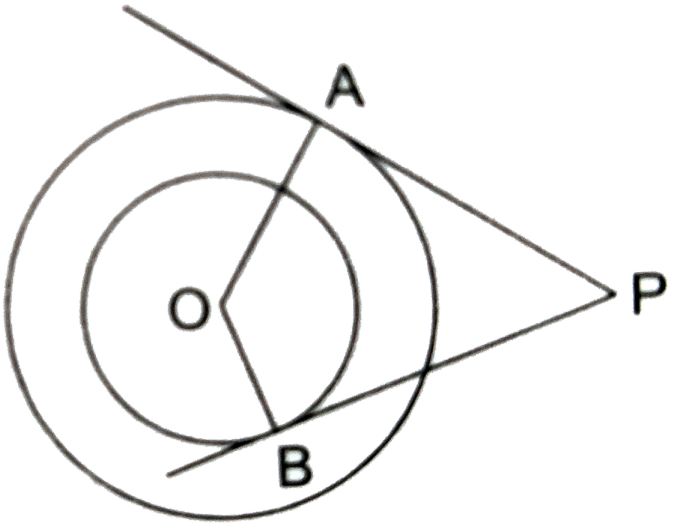
4. Tangents PA and PB are drawn from an external point P to two concentric circles with centre O and radii $8cm$ and $5cm$ respectively, as shown in the figure. If $AP = 15cm$ then find the length of BP.



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5. In Fig. 10.21, 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 . (FIGURE)

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6. Two concentric circles of radii a and $b(a > b)$ are given. Find the length of the chord of the larger circle which touches the smaller circle.

A. $2\sqrt{a^2+b^2}$

B. $2\sqrt{b^2-a^2}$

C. $2\sqrt{a^2-b^2}$

D. none of these

Answer: C

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7. Two concentric circles are of radii $7cm$ and rcm respectively, where $r > 7$. A chord of the

larger circle of length $46cm$, touches the smaller circle. Find the value of r.

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8. The radii of two concentric circle are 13 cm and 8 cm. AB is a diameter of the bigger circle and BD is a tangent to the smaller circle touching it at D and the bigger circle at E. Point A is joined to D. Find the length of AD.

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9. From a point P outside a circle with centre O, tangents PA and PB are drawn to the circle. Prove that OP is the right bisector of the line segment AB.

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10. Prove that the tangents at the extremities of any chord make equal angles with the chord.

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11. Prove that tangent drawn at the mid point of the are of a circle is pallelar to the chord joing the ends of point of the are

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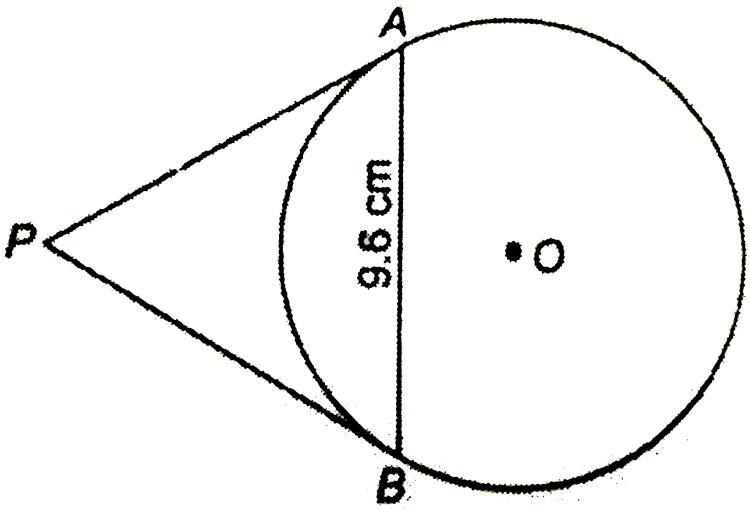
12. In the adjoining figure, AB is a chord of length 9.6 cm of a circle with centre O and radius 6 cm. The tangents at A and B intersect

at P. Find the length of PA.



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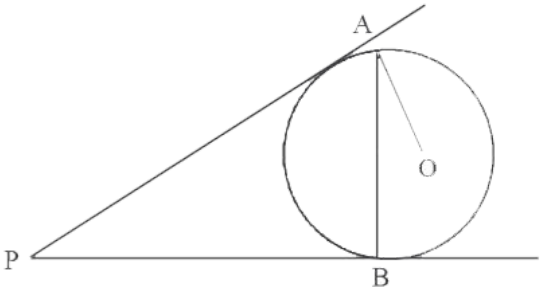
13. Two tangents PA and PB are drawn to a circle with centre O from an external point P.

Prove that $\angle APB = 2\angle OAB$



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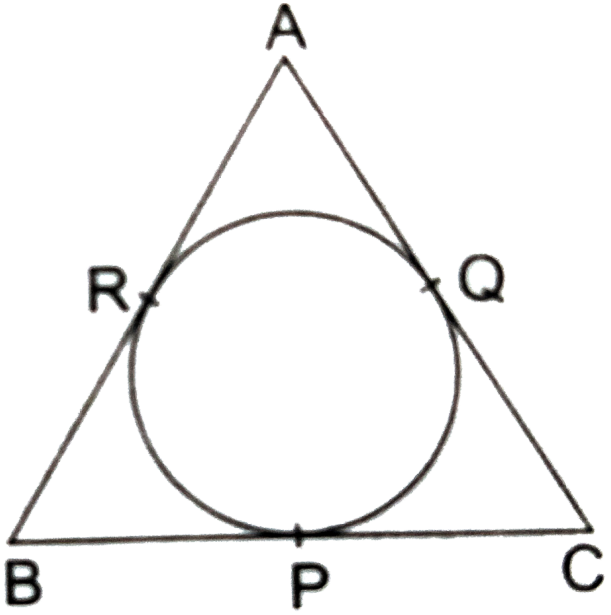
14. In the given figure, the incircle of ΔABC touches the sides BC, CA and AB at P, Q and R respectively. Prove that

$(AR + BP + CQ) = (AQ + BR + CP)$

$= \frac{1}{2}(\text{perimeter of} \Delta ABC).$



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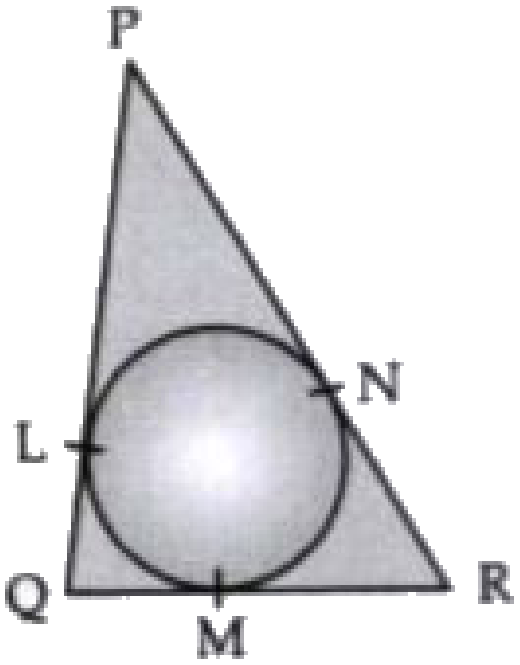
15. In fig , a circle isinscribed in a triangle PQR with PQ = 10 cm , QR = 8 cm and PR = 12 cm

.Find the length of the QM , RN and PL.



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16. A circle is inscribed in a ΔABC touching AB, BC and AC at P, Q and R respectively. If AB =

10 cm, AR = 7 cm and CR = 5 cm, then find the length of BC.

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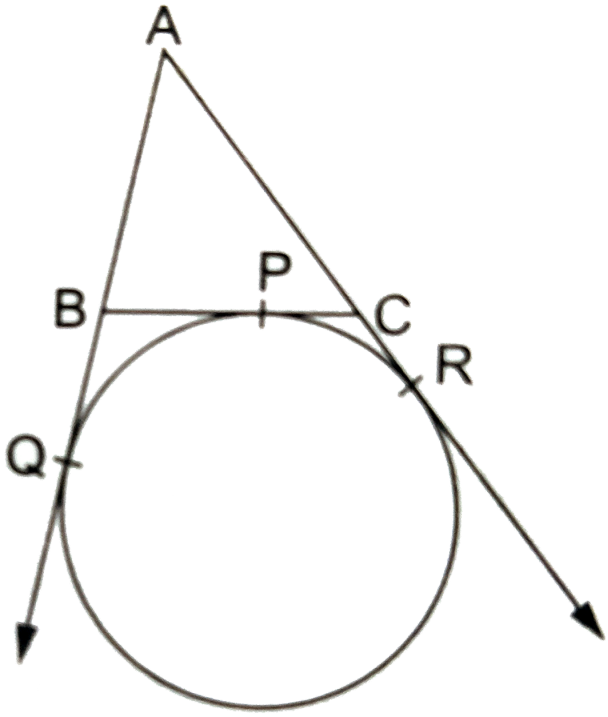
17. A circle is touching the side BC of ΔABC at P and touching AB and AC produced at Q and R respectively. Prove that

$AQ = \frac{1}{2}(\text{perimeter of} \Delta ABC).$



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18. PA and PB are tangents to the circle with centre O from an external point P, touching the circle at A and B respectively. Show that the quadrilateral $AOBP$ is cyclic.

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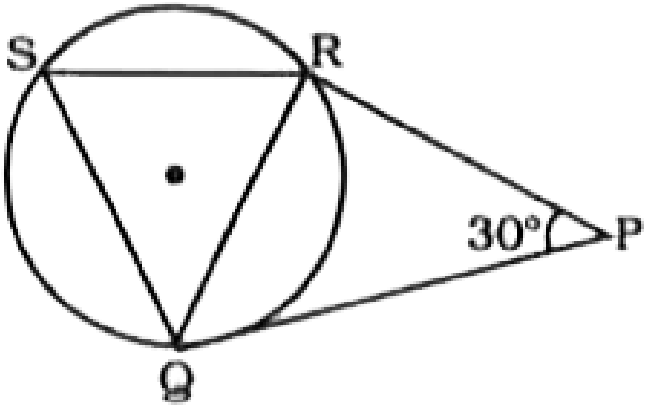
19. In the given figure tangents PQ and PR are drawn from an external point P to a circle with centre O, such that $\angle RPO = 30^\circ$. A chord RS is drawn parallel to the tangent PQ. Find

$\angle RQS$.



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

Prove that : $(i) AB + CQ = AC + BQ$

(ii) Area

$$(\triangle ABC) = \frac{1}{2}(\text{Perimeter of } \triangle ABC) \times r$$

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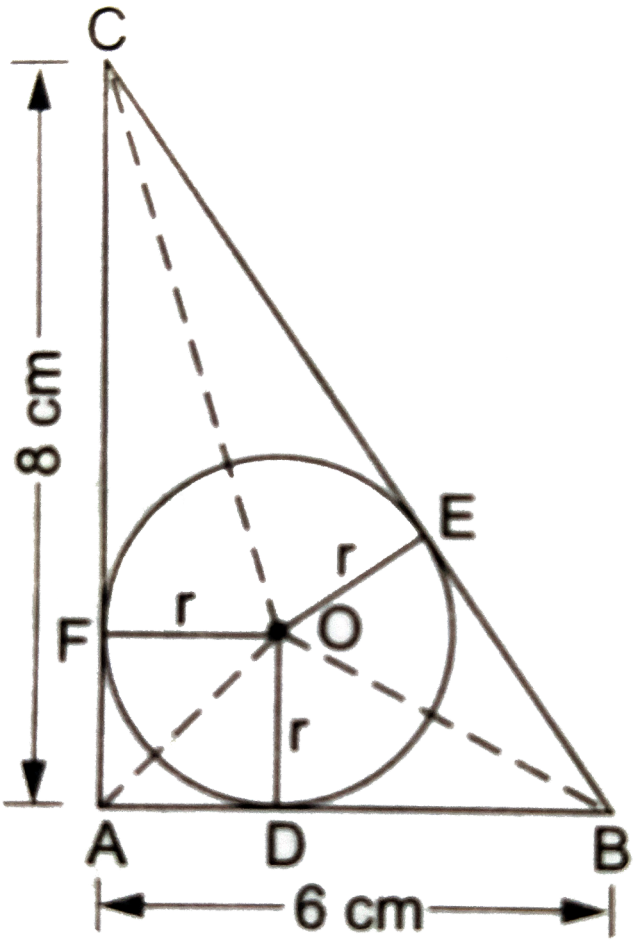
21. In the given figure, ABC is a right-angled triangle with $AB = 6cm$ and $AC = 8cm$. A circle with centre O has been inscribed inside the triangle. Calculate the value of r, the radius

of the inscribed circle.



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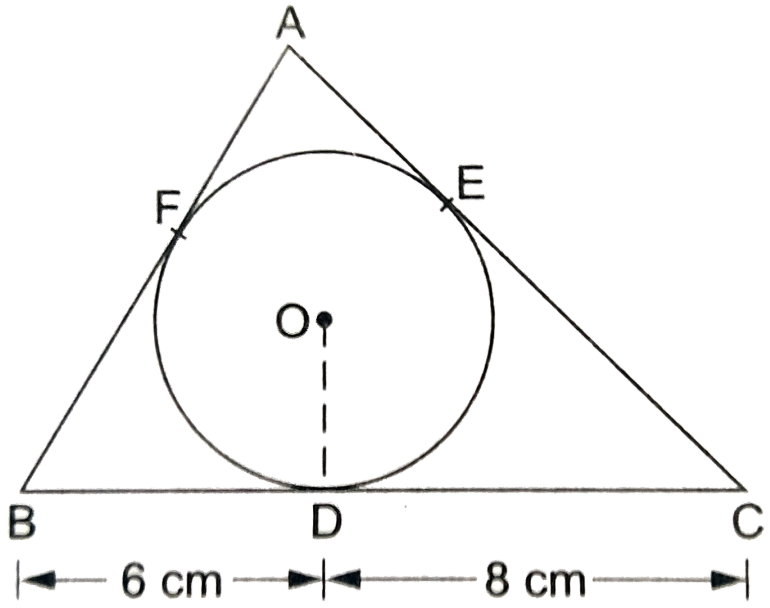
22. A triangle ABC is drawn to circumscribe a circle of radius $4cm$ such that the segments BD and DC into which BC is divided by the point of contact D are of lengths $6cm$ and $8cm$ respectively. Find the lengths of the sides AB and AC.



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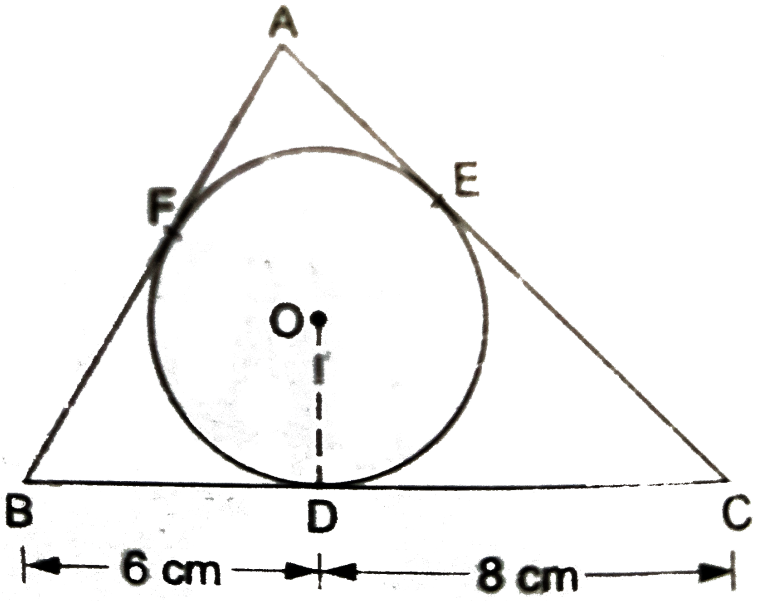
23. In the given figure, a triangle ABC is drawn to circuscribe a circle of radius $3cm$, such that the segments BD and DC into which BC is divided by the point of contact D are of lengths $6m$ and $8cm$ respectively. Find the side AB, if

the area of ΔABC is $63cm^2$.



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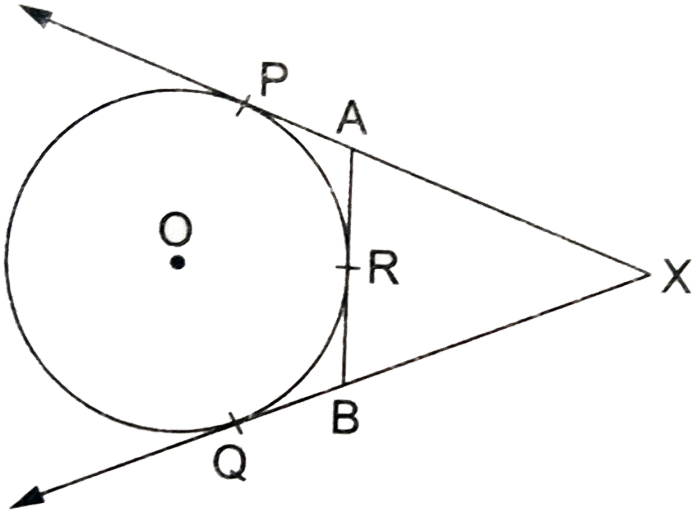
24. In the given figure, XP and XQ are two tangents to the circle with centre O, drawn from an external point X. ARB is another tangent,

touching the circle at R. Prove that $XA + AR = XB + BR$.



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25. If from an external point P of a circle with centre O, two tangents PQ and PR are drawn

such $\angle QPR = 120^\circ$, prove that 2PQ=PO.

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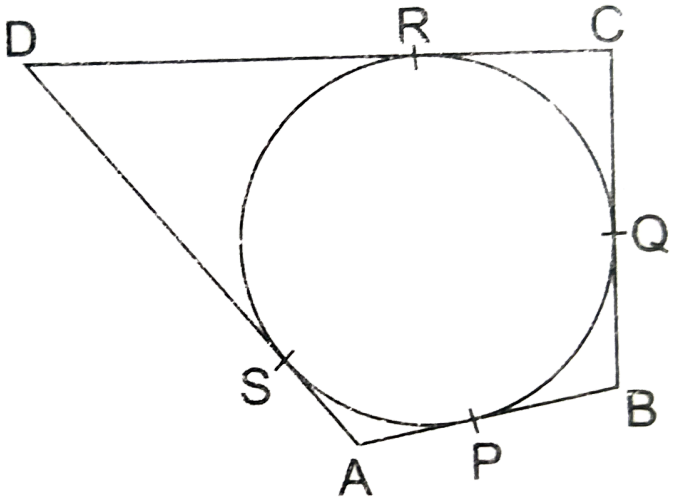
26. A quadrilateral $ABCD$ is drawn to circumscribe a circle, as shown in the figure. Prove that $AB + CD = AD + BC$.



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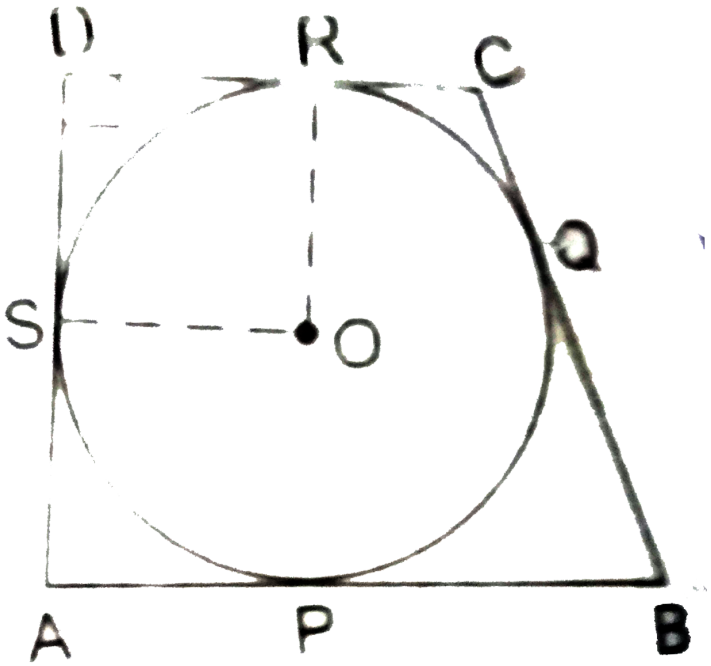
27. In the given figure, $ABCD$ is a quadrilateral such that $\angle D = 90^\circ$. A circle with centre O and radius r, touches the sides AB, BC, CD and DA at P, Q, R and S respectively. If $BC = 40cm$, $CD = 25cm$ and $BP = 28cm$,

find r.



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28. सिद्ध कीजिए कि किसी वृत्त के परिगत समांतर चतुर्भुज समचतुर्भुज होता है ।

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29. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

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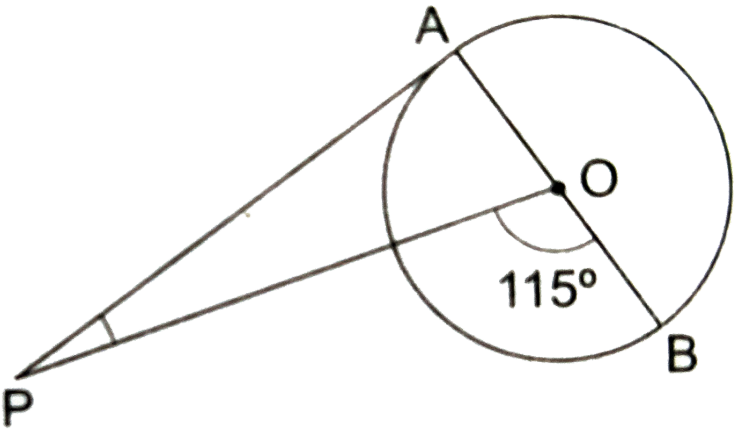
30. In the given figure, PA is a tangent from an external point P to a circle with centre O. If

$\angle POB = 115^\circ$, find $\angle APO$.



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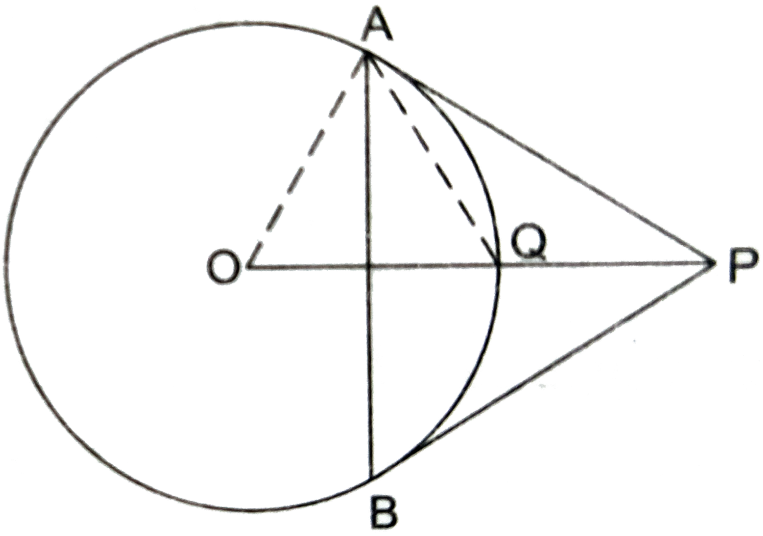
31. From a point P, two tangents PA and PB are drawn to a circle $C(O, r)$. If $OP = 2r$, show

that ΔAPB is equilateral.



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32. XY and $X'Y'$ are two parallel tangents to a circle with centre O and another tangent AB with

point of contact C intersecting XY at A and $X'Y'$ at B. Prove that $\angle AOB = 90^o$

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33. The incircle of an isosceles triangle ABC, with $AB = AC$, touches the sides AB, BC, CA at D, E and F respectively. Prove that E bisects BC.

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Exercise 8 A

1. A point P is at a distance of $29cm$ from the centre of a circle of radius $20cm$. Find the length of the tangent drawn from P to the circle.

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2. A point P is $25cm$ away from the centre of a circle and the lens of tangent drawn from P to the circle is $24cm$. Find the radius.

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3. Two concentric circles are of radii $6.5cm$ and $2.5cm$. Find the length of the chord of the larger circle which touches the smaller circle.

A. $9cm$

B. $10cm$

C. $11cm$

D. $12cm$

Answer: D

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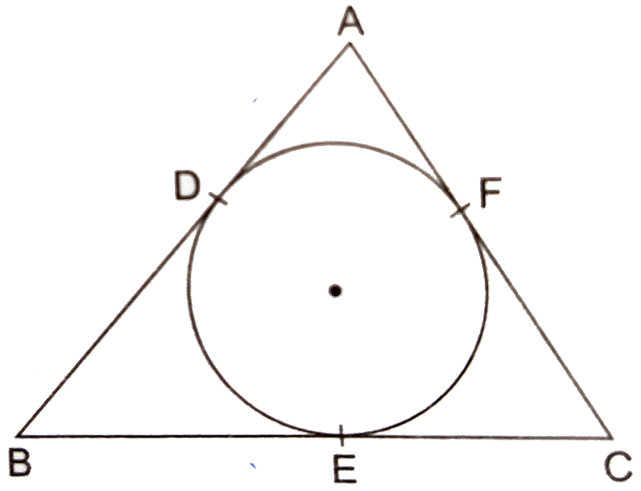
4. In the given figure, a circle inscribed in a triangle ABC, touches the sides AB, BC and AC at points D, E and F respectively. If $AB = 12cm$, $BC = 8cm$ and $AC = 10cm$, find the lengths of AD, BE and CF.



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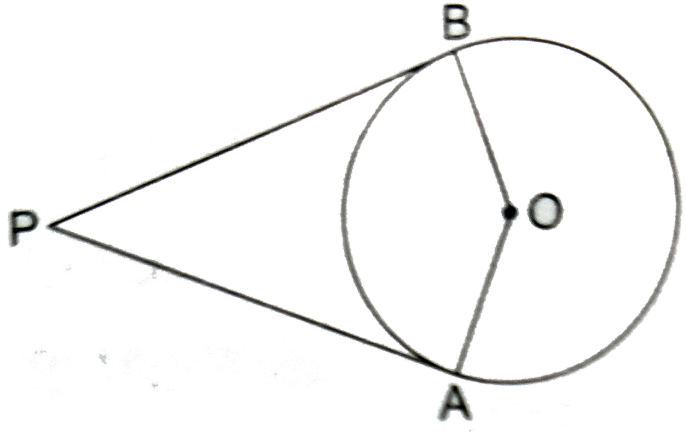
5. In the given figure, PA and PB are the tangent segments to a circle with centre O. Show that the points A, O, B and P are concyclic.



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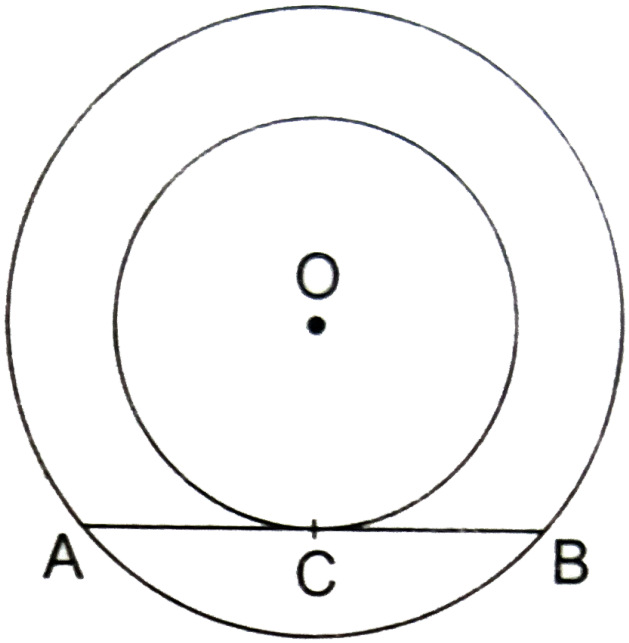
6. In the given figure, the chord AB of the larger of the two concentric circles, with centre O, touches the smaller circle at C. Prove that $AC = CB$.



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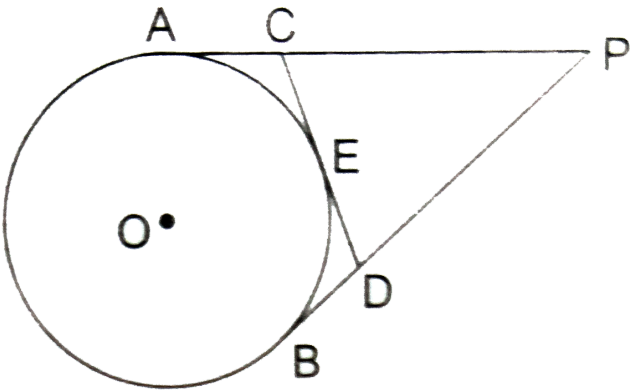
7. From an external point P, tangents PA and PB are drawn to a circle with centre O. If CD is the tangent to the circle at a point E and $PA = 14cm$, find the perimeter of ΔPCD.



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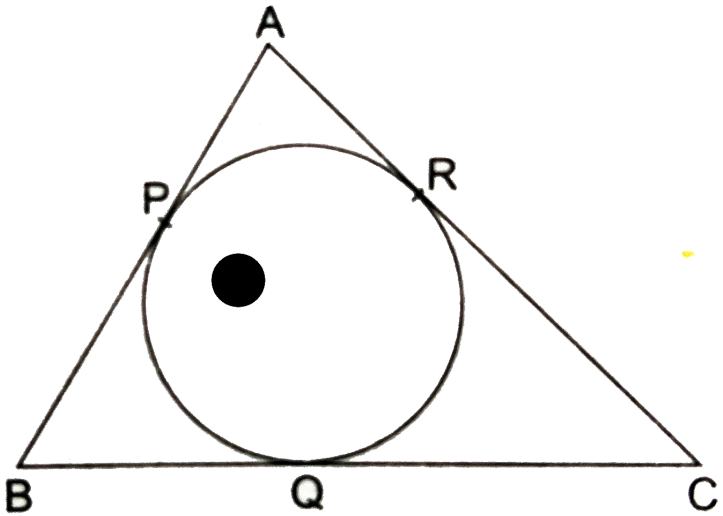
8. A circle is inscribed in a ΔABC, touching AB, BC and AC at P, Q and R respectively. If $AB = 10cm$, $AR = 7cm$ and $CR = 5cm$, find the length of BC.



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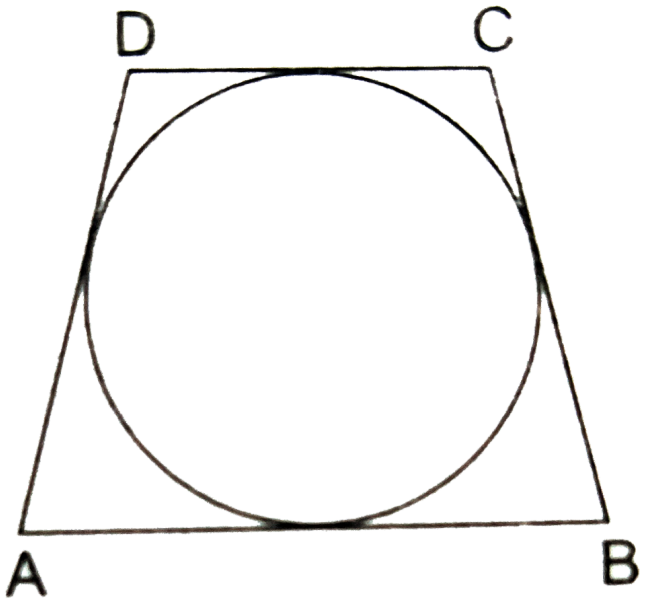
9. In the given figure, a circle touches all the four sides of a quadrilateral $ABCD$ whose three sides are $AB = 6cm$, $BC = 7cm$ and $CD = 4cm$. Find AD.



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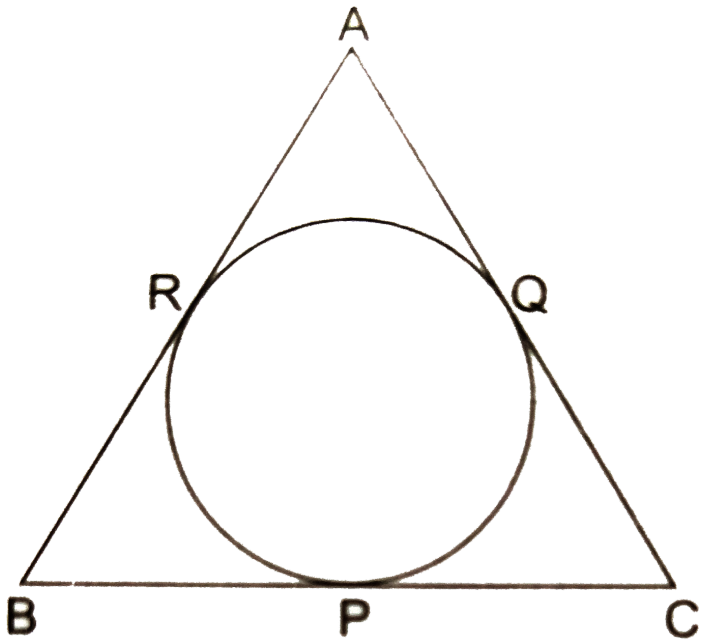
10. In the given figure, an isosceles triangle ABC, with $AB = AC$, circumscribes a circle. Prove that the point of contact P bisects the base BC.



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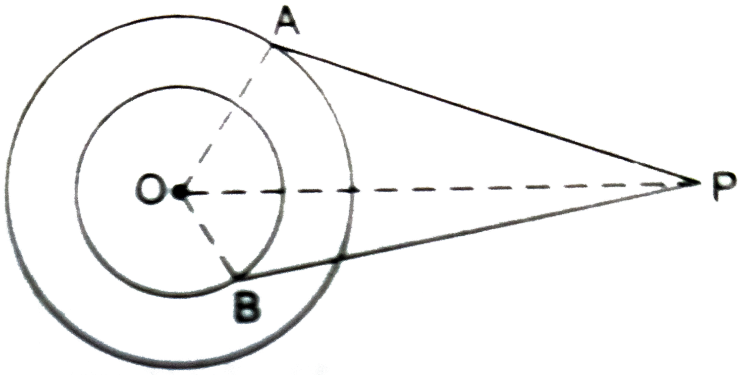
11. In the given figure, O is the centre of two concentric circles of radii $4cm$ and $6cm$ respectively. PA and PB are tangents to the outer and inner circle respectively. If $PA = 10cm$, find the length of PB up to one place of decinal.



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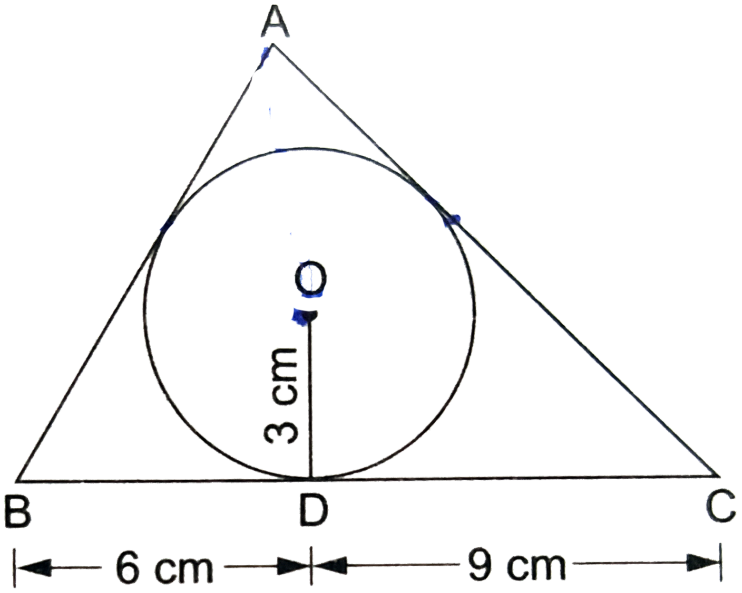
12. In the given figure, a triangle ABC is drawn to circuscribe a circle of radius $3cm$, such that the segments BD and DC into which BC is divided by the point of contact D are of lengths $6cm$ and $9cm$ respectively. If the area of $\Delta ABC = 54cm^2$ then find the lengths of sides

AB and AC.



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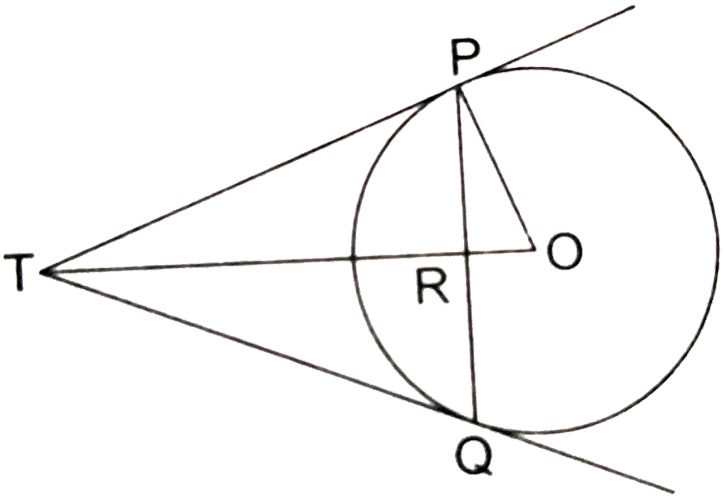
13. PQ is a chord of length $4.8cm$ of a circle of radius $3cm$. The tangents at P and Q intersect at a point T as shown in the figure. Find the

length of TP.



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14. Prove that the line segment joining the points of contact of two parallel tangents of a circle, passes through its centre.

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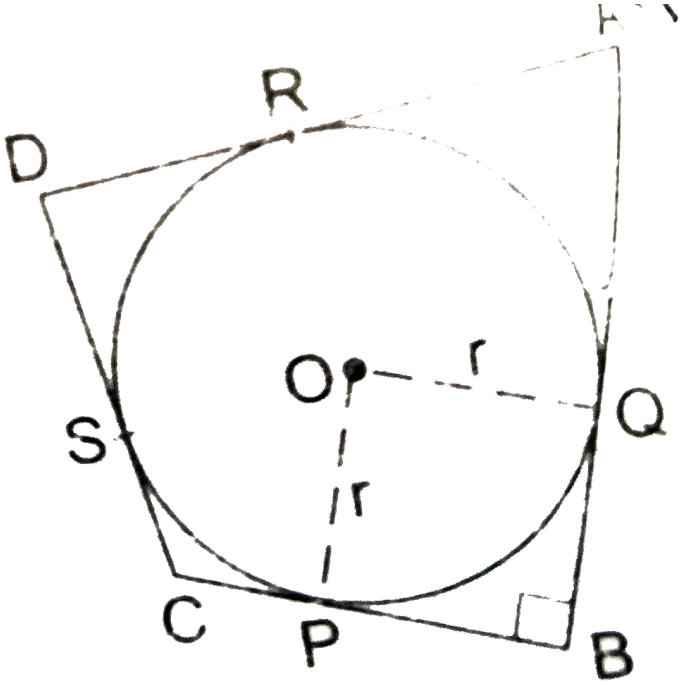
15. In the given figure, a circle with centre O, is inscribed in a quadrilateral $ABCD$ such that it touches the side BC, AB, AD and CD at points P, Q, R and S respectively. If $AB = 29cm$, $AD = 23cm$, $\angle B = 90^\circ$ and $DS = 5cm$ then

find the radius of the circle.



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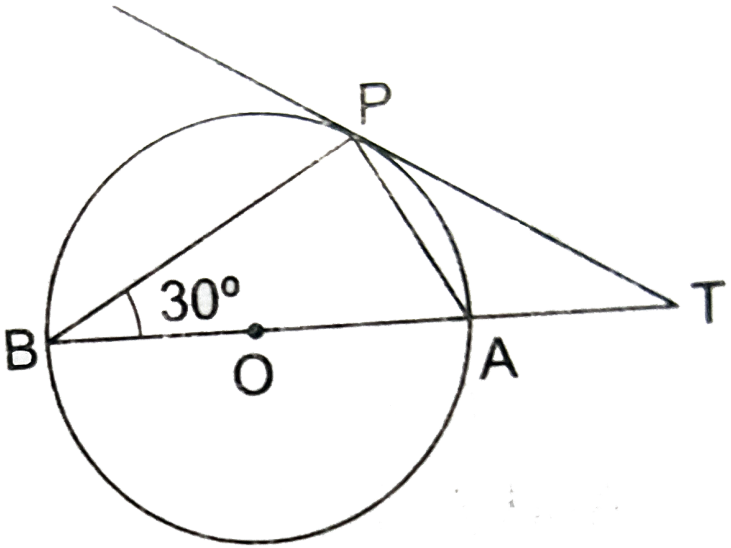
16. In the given figure, O is the centre of the circle and TP is the tangent to the circle from

an external point T. If $\angle PBT = 30^\circ$, prove that

$BA : AT = 2 : 1$.



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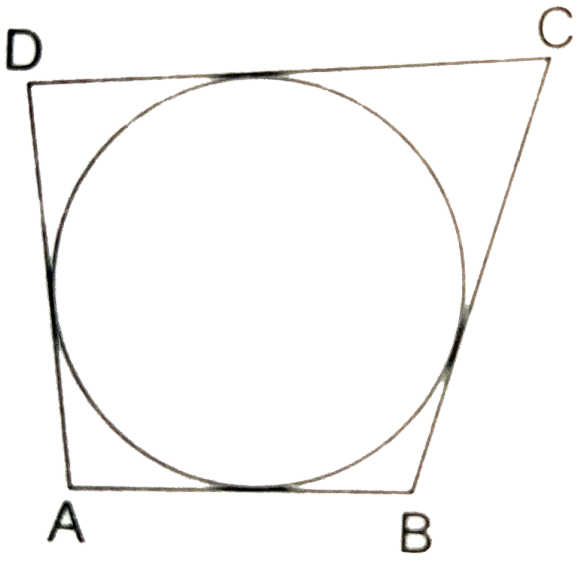
Exercise 8 B

1. In the adjoining figure, a circle touches all the four sides of a quadrilateral $ABCD$ whose sides are $AB = 6cm$, $BC = 9cm$ and $CD = 8cm$. Find the length of side AD.



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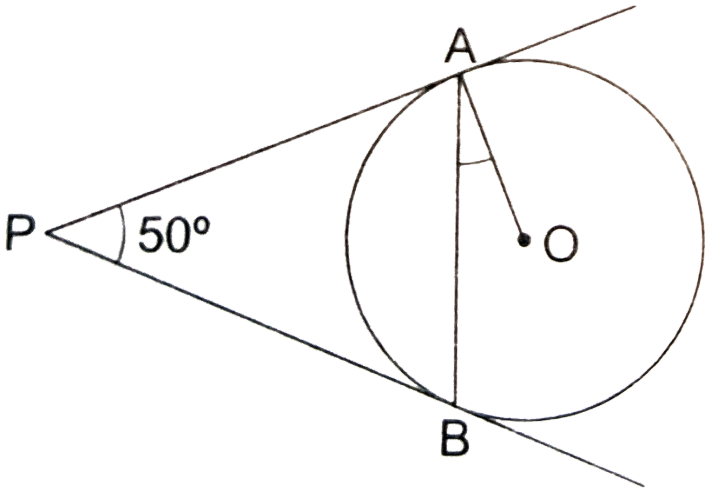
2. In the given figure, PA and PB are two tangents to the circle with centre O. If $\angle APB = 50^\circ$ then what is the measure of $\angle OAB$.



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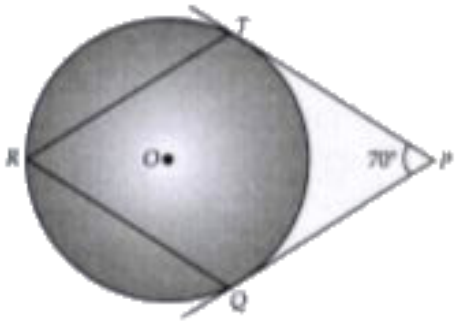
3. In figure, O is the centre of a circle. PT and PQ are tangents to the circle from an external point P. If $\angle TPQ = 70^\circ$, find $\angle TRQ$.



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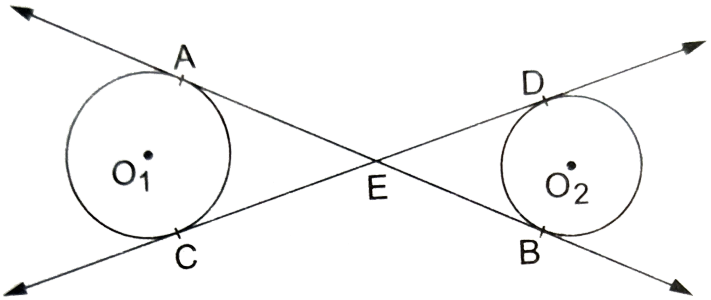
4. In the given figure, common tangetns AB and CD to the two circles with centres O_1 and O_2 intersect at E. Prove that $AB = CD$.



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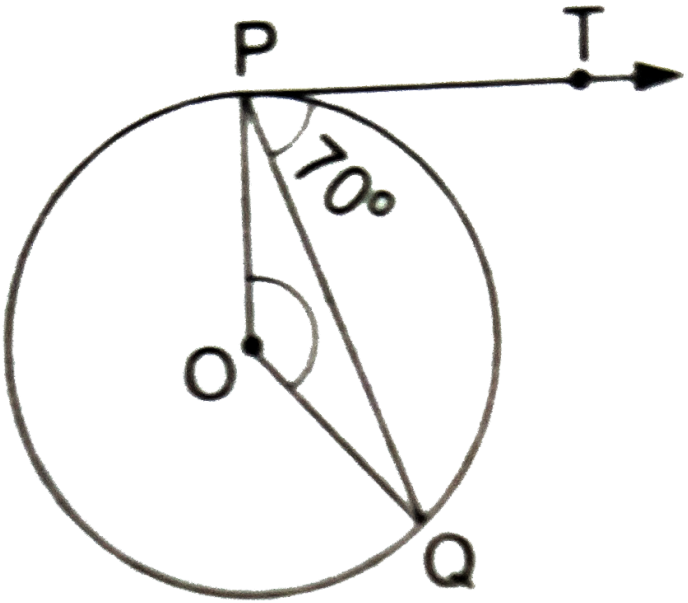
5. If PT is a tangent to a circle with centre O and PQ is a chord of the circle such that

$\angle QPT = 70^\circ$, then find the measure of $\angle POQ$.



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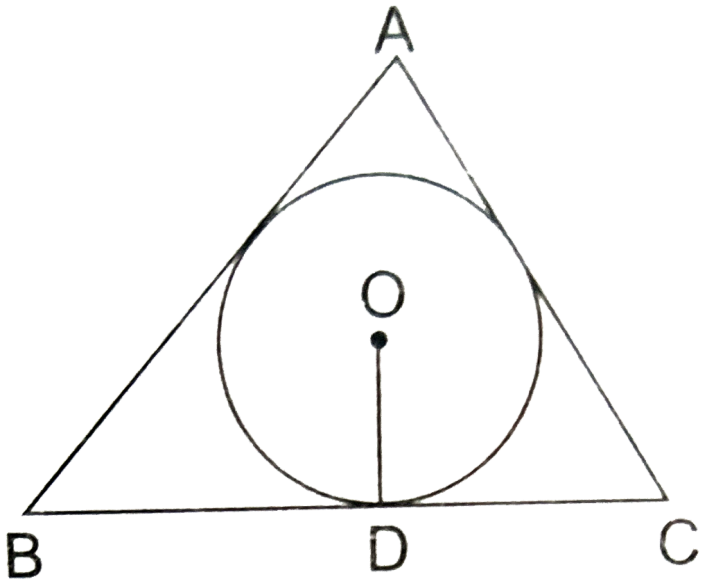
6. In the given figure, a triangle ABC is drawn to circumscribe a circle of radius $2cm$ such that the

segments BD and DC into which BC is divided by the point of contact D, are of lengths $4cm$ and $3cm$ respectively. If the area of $\Delta ABC = 21cm^2$ then find the lengths of sides AB and AC.



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7. Two concentric circles are of radii $5cm$ and $3cm$ respectively. Find the length of the chord of the larger circle which touches the smaller circle.

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8. Prove that the perpendicular at the point of contact to the tangent to a circle passes through the centre of the circle.

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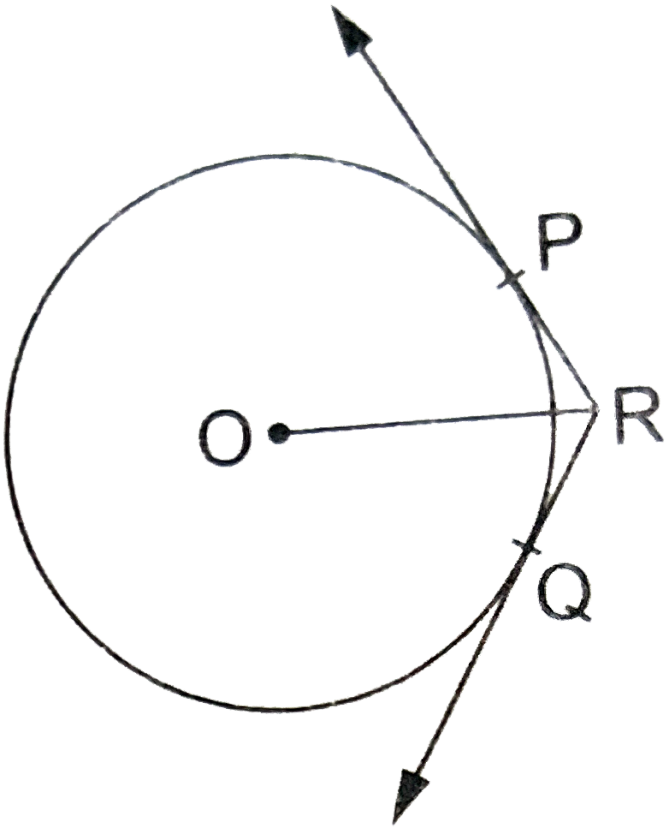
9. In the given figure, two tangents RQ and RP are drwn from an external point R to the circle with centre O. If $\angle PRQ = 120^\circ$, then prove that OR=PR+RQ`.



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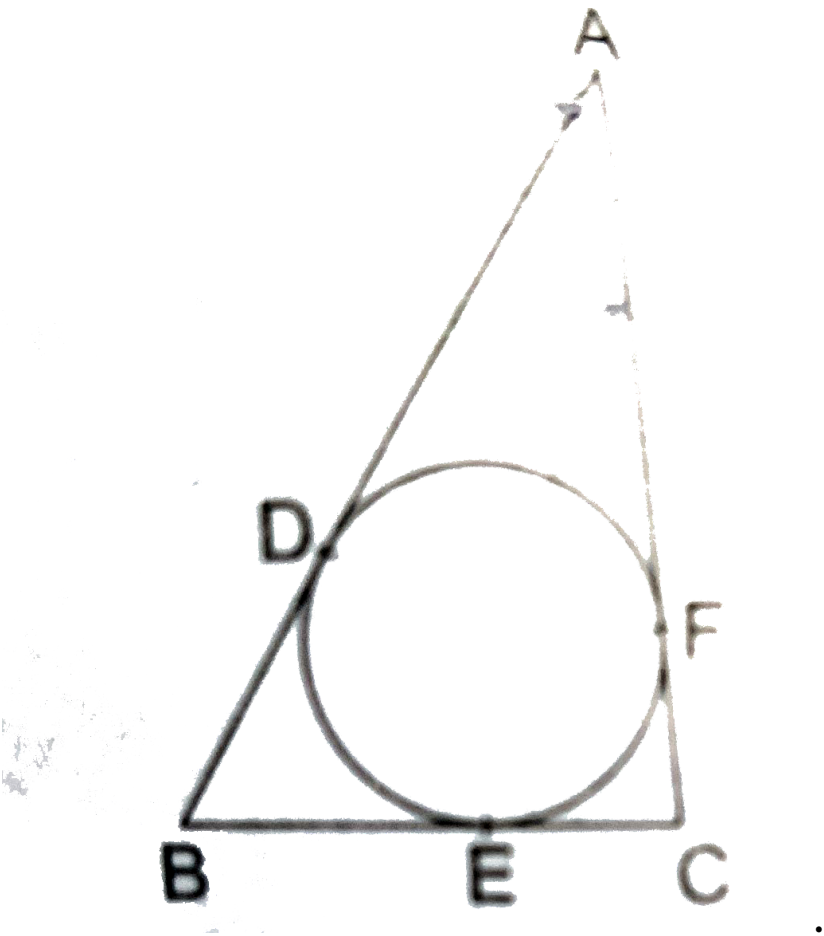
10. In the given figure, a circle inscribed in a triangle ABC, touches the sides AB, BC and CA at points D, E and F respectively. If $AB = 14cm$, $BC = 8cm$ and $CA = 12cm$, find

the lengths of AD, BE and CF.



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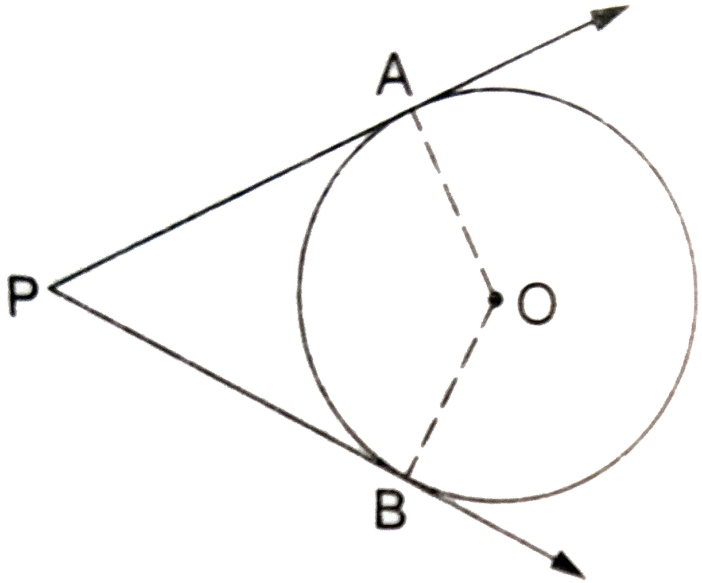
11. In the given figure, O is the centre of the circle. PA and PB are tangents. Show that $AOBP$ is a cyclic quadrilateral.



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12. In two concentric circles, a chord of length $8cm$ of the larger circle touches the smaller circle. If the radius of the larger circle is $5cm$ then find the radius of the smaller circle.

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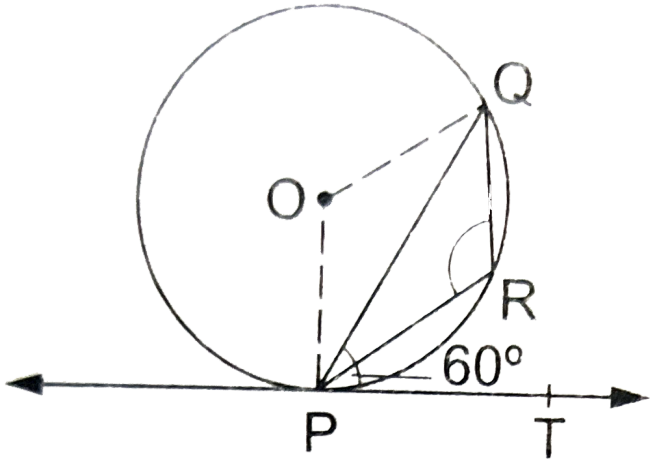
13. In the given figure, PQ is a chord of a circle with centre O and PT is a tangent. If

$\angle QPT = 60^\circ$, find $\angle PRQ$.



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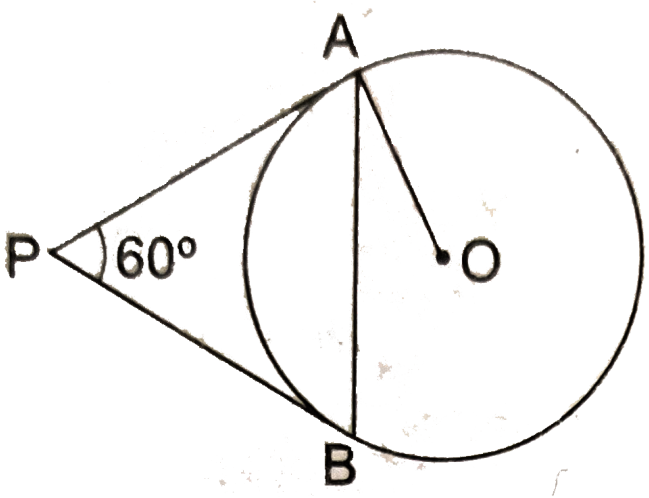
14. In the given figure, PA and PB are two tangetns to the circle with centre O. If

$\angle APB = 60^\circ$ then find the measure of $\angle OAB$.



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15. If the angle between two tangents drawn from an external point P to a circle of radius 'a' and centre O, is 60°, then find the length of OP.

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Multiple Choice Questions Mcq

1. Theorem 10.2 : The lengths of tangents drawn from an external point to a circle are equal.

A. equal

B. unequal

C. may be equal may be unequal

D. None of these

Answer:

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2. Which of the following pairs of lines in a circle cannot be parallel?

A. Two chords

B. A chord and a tangent

C. Two tangents

D. Two diameters

Answer:

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3. The chord of a circle of radius $10cm$ subtends a right angle at its centre. The length of the chord (in cm) is

A. $\frac{5}{\sqrt{2}}$

B. $5\sqrt{2}$

C. $10\sqrt{2}$

D. $10\sqrt{3}$

Answer: C

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4. PQ is a tangent to a circle with centre O at the point P. If ΔOPQ is an isoceless triangle, then $\angle OQP$ is equal to

A. 30°

B. 45°

C. 60°

D. 90°

Answer:

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5. If a chord AB subtends and angle of 60° at the centre of a circle, then the angle between the tangents to the circle drawn from A and B is

A. 30°

B. 60°

C. 90°

D. 120°

Answer: D

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6. If two tangents inclined at an angle of 60° are drawn to a circle of radius $3cm$ then the length of each tangent is

A. $3cm$

B. $\frac{3\sqrt{3}}{2}cm$

C. $3\sqrt{3}cm$

D. $6cm$

Answer: C

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7. The length of the tangent from an external point P to a circle of radius $5cm$ is $10cm$. The distacne of the point from the centre of the circle is

A. $8cm$

B. $\sqrt{104}cm$

C. $12cm$

D. $\sqrt{125}cm$

Answer:

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8. To draw a pair of tangents to a circle, which are inclined to each other at an angle of 45°, we have to draw tangents at the end points of those two radii, the angle between which is

A. 105°

B. 135°

C. 140°

D. 145°

Answer: B

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

A. $1cm$

B. $2cm$

C. $3cm$

D. $4cm$

Answer:

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10. Quadrilateral $ABCD$ is circumscribed to a circle. If $AB = 6cm$, $BC = 7cm$ and $CD = 4cm$ then the length of AD is

A. $3cm$

B. $4cm$

C. $6cm$

D. $7cm$

Answer: A

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11. Which of the following statements is not true

?

A. If a point P lies inside a circle, no tangent can be drawn to the circle, passing through P.

B. If a point P lies on the circle, then one and only one tangent can be drawn to the circle at P.

C. If a point P lies outside the circle, then only two tangents can be drawn to the circle from P.

D. A circle can have more than two parallel tangents, parallel to a given line.

Answer: D

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12. Which of the following statements is not true ?

A. A tangent to a circle intersects the circle exactly at one point.

B. The point common to the circle and its tangent is called the point of contact.

C. The tangent at any point of a circle is perpendicular to the radius of the circle through the point of contact.

D. A straight line can meet a circle at one point only.

Answer: D

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13. Which of the following statements is not true ?

A. A line which intersects a circle in two points, is called a secant of the circle.

B. A line intersecting a circle at one point only, is called a tangent to the circle.

C. The point at which a line touches the circle, is called the point of contact.

D. A tangent to the circle can be drawn from a point inside the circle.

Answer: D

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14. Assertion(A) At a point P of a circle with centre O and radius $12cm$, a tangent PQ of length $16cm$ is drawn. Then, $OQ = 20cm$.

Reason (R) The tangent at any point of a circle is perpendicular to the radius through the point of contact.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Asseration (A).

B. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Asseration (A).

C. Assertion(A) is true and Reason (R) is false.

D. Assertion(A) is false and Reason (R) is true.

Answer: A

15. Assertion(A) If two tangents are drawn to a circle from an external point then they subtend equal angles at the centre.

Reason (R) A parallelogram circumscribing a circle is a rhombus

A. Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Asseration (A).

B. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Asseration (A).

C. Assertion(A) is true and Reason (R) is false.

D. Assertion(A) is false and Reason (R) is true.

Answer:

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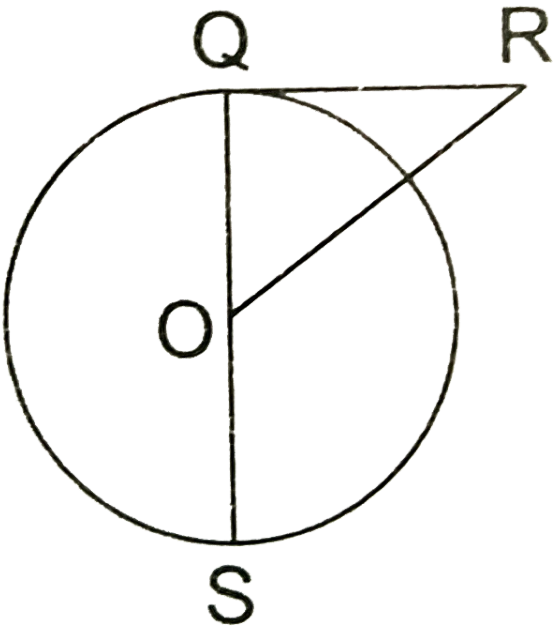
Multiple Choice Questions Mcq

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



A. $2.5cm$

B. $3cm$

C. $5cm$

D. $8cm$

Answer:

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2. In a circle of radius 7 cm, tangent PT is drawn from a point P such tht PT= 24 cm. If O is the centre of circle, then find the length of OP.

A. $30cm$

B. $28cm$

C. $25cm$

D. $18cm$

Answer:

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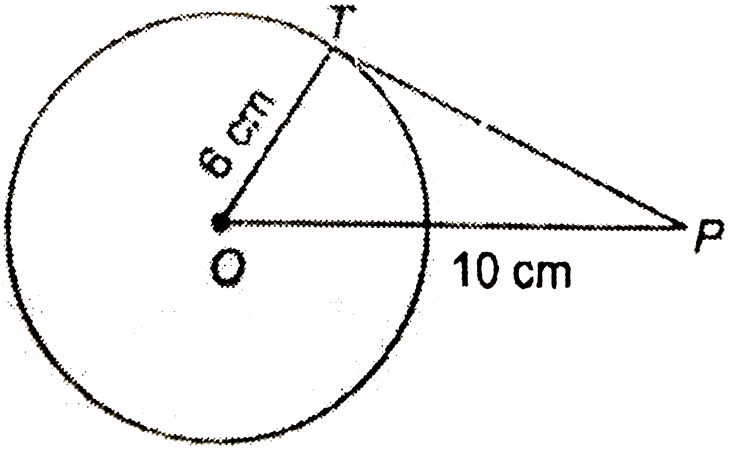
3. In the given figure, PT is a tangent to the circle with centre O. If OT=6cm and OP=10cm, thcn find

the length of tangent PT.



A. $8cm$

B. $10cm$

C. $12cm$

D. $16cm$

Answer:

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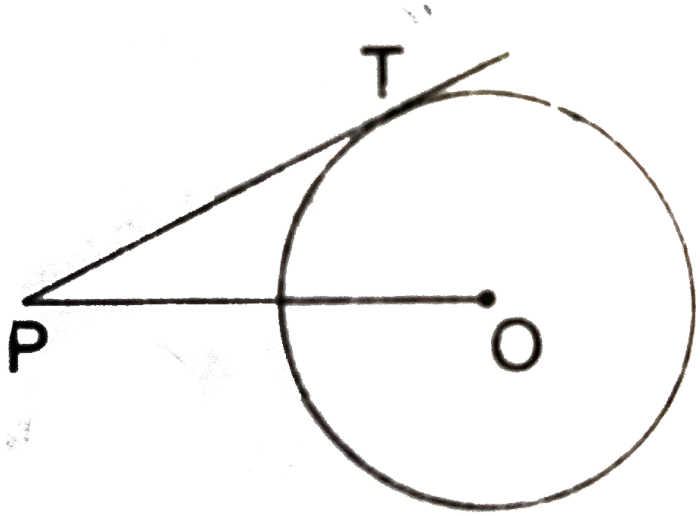
4. In the given figure, point P is $26cm$ away from the centre O of a circle and the length PT of the tangent drawn from P to the circle is $24cm$. Then, the radius of the circle is



A. $10cm$

B. $12cm$

C. $13cm$

D. $15cm$

Answer:

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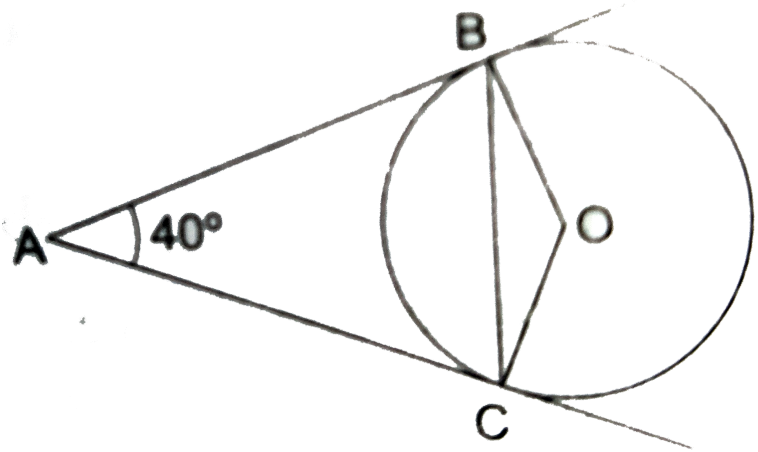
5. In the given figure, AB and AC are tangents to the circle with centre O such that

$\angle BAC = 40^\circ$. Then , $\angle BOC$ is equal to



A. 80°

B. 100°

C. 120°

D. 140°

Answer:

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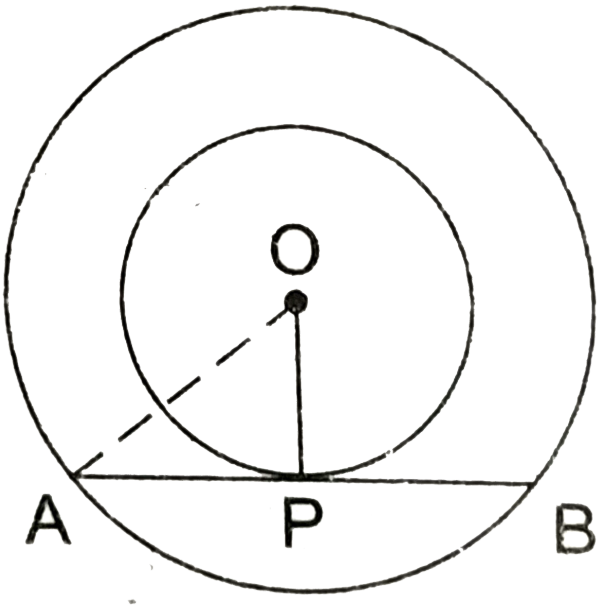
6. In the given figure, O is the centre of two concentric circles of radii $6cm$ and $10cm$. AB is chord of outer circle which touches the inner circle. The length of chord AB is



A. $8cm$

B. $14cm$

C. $16cm$

D. $\sqrt{136}cm$

Answer:

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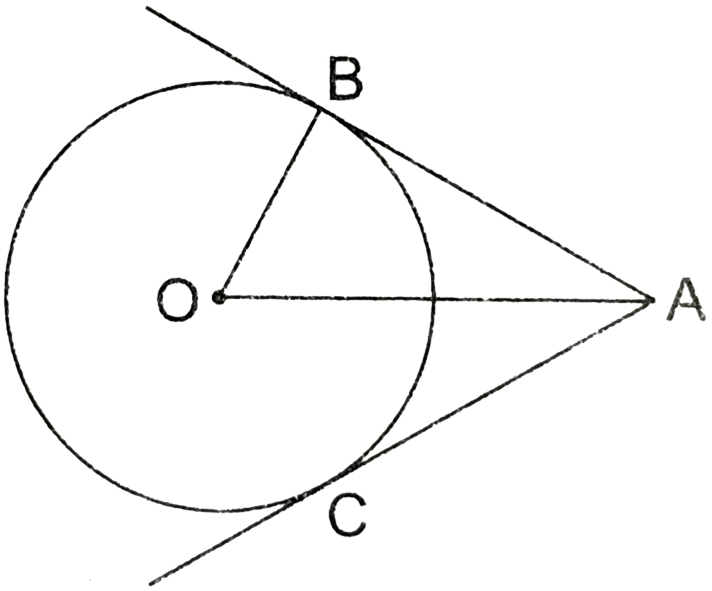
7. In the given figure, AB and AC are tangents to a circle with centre O and radius $8cm$. If

$OA = 17cm$, then the length of AC (in cm) is



A. 9

B. 15

C. $\sqrt{353}$

D. 25

Answer:

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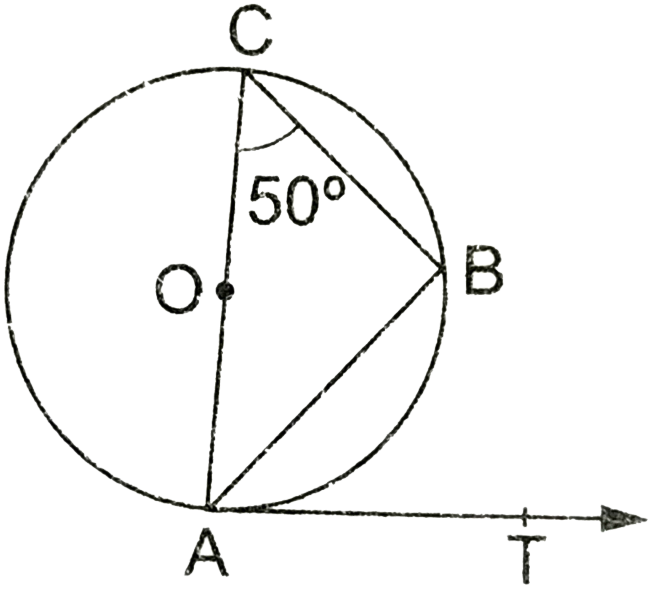
8. In the given figure, O, is the centre of a circle, AOC is its diameter such that $\angle ACB = 50^\circ$. If AT is the tangent to the circle at the point A

then $\angle BAT = ?$



A. 40°

B. 50°

C. 60°

D. 65°

Answer:

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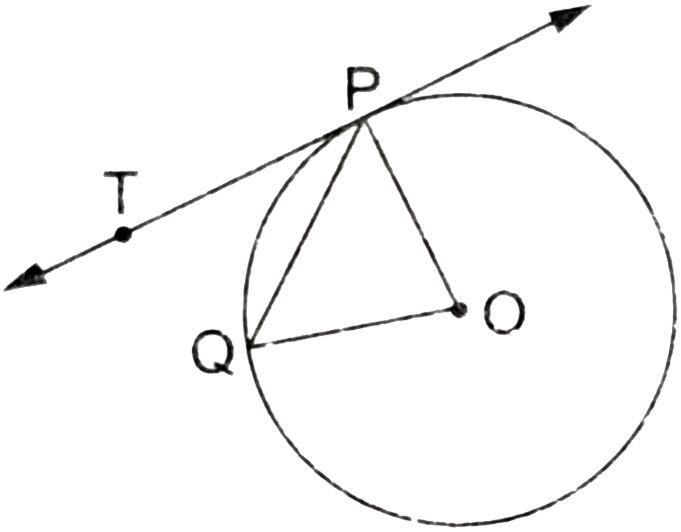
9. In the given figure, O is the centre of a circle, PQ is a chord and PT is the tangent at P. If $\angle POQ = 70^\circ$, then $\angle TPQ$ is equal to



A. 35°

B. 45°

C. 55°

D. 70°

Answer:

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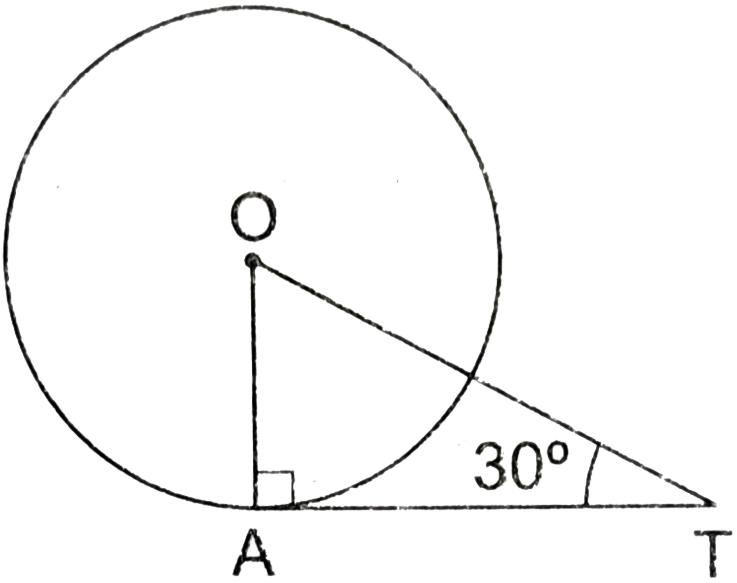
10. In the given figure, AT is a tangent to the circle with centre O such that $OT = 4cm$ and

$\angle OTA = 30^\circ$. Then $AT = ?$



A. $4cm$

B. $2cm$

C. $2\sqrt{3}cm$

D. $4\sqrt{3}cm$

Answer:

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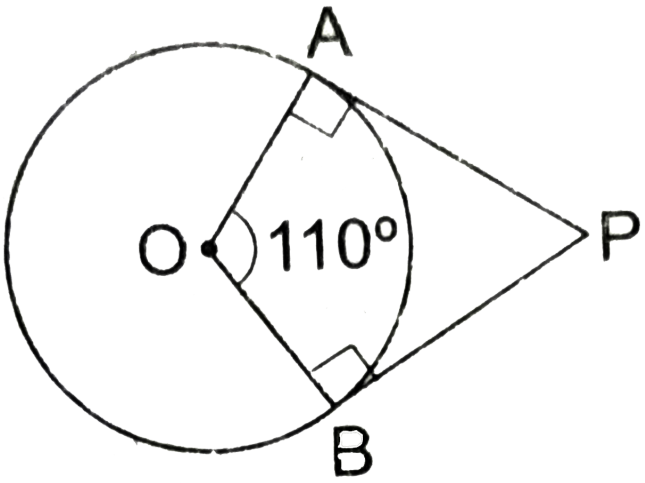
11. If PA and PB are two tangents to a circle with centre O such that $\angle AOB = 110^\circ$ then $\angle APB$ is equal to



A. 55°

B. 60°

C. 70°

D. 90°

Answer:

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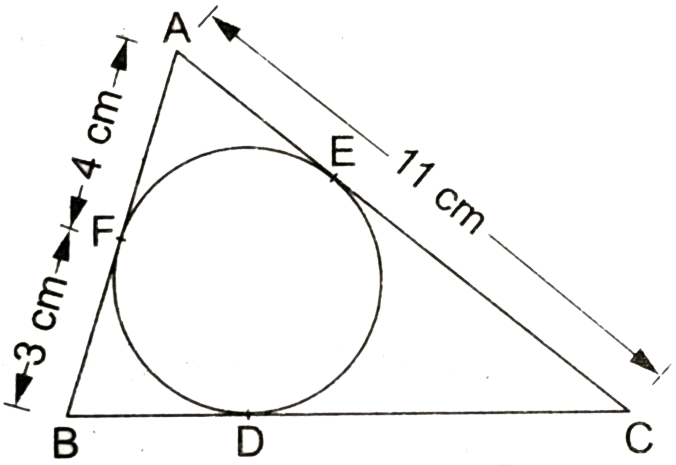
12. In the given figure, the length of BC is



A. $7cm$

B. $10cm$

C. $14cm$

D. $15cm$

Answer:

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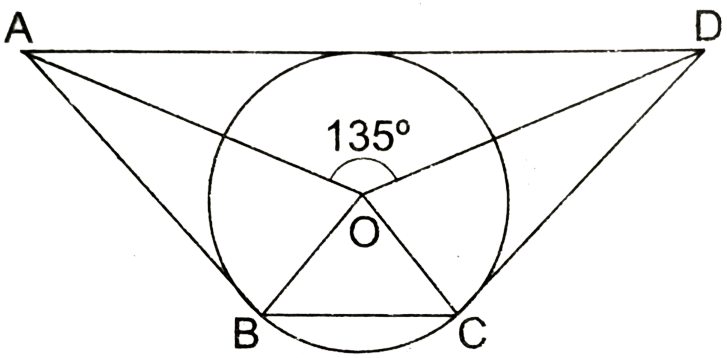
13. In the given figure, if, $\angle AOD = 135^\circ$ then $\angle BOC$ is equal to



A. 25°

B. 45°

C. 52.5°

D. 62.5°

Answer:

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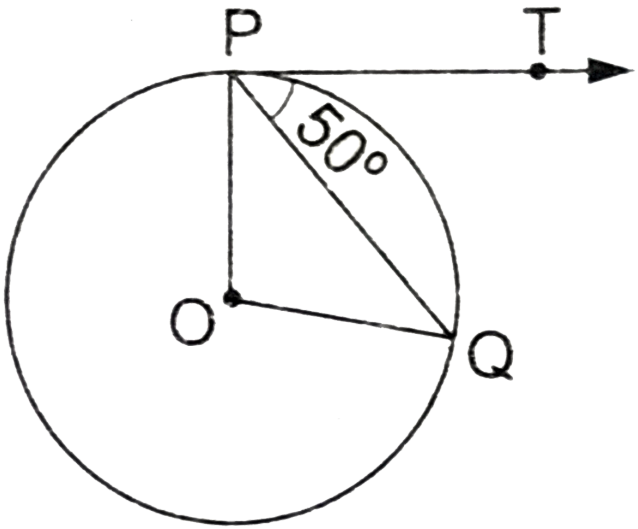
14. In the given figure, O is the centre of a circle and PT is the tangent to the circle. If PQ is a chord such that $\angle QPT = 50^\circ$ then

$\angle POQ = ?$



A. 100°

B. 90°

C. 80°

D. 75°

Answer: A

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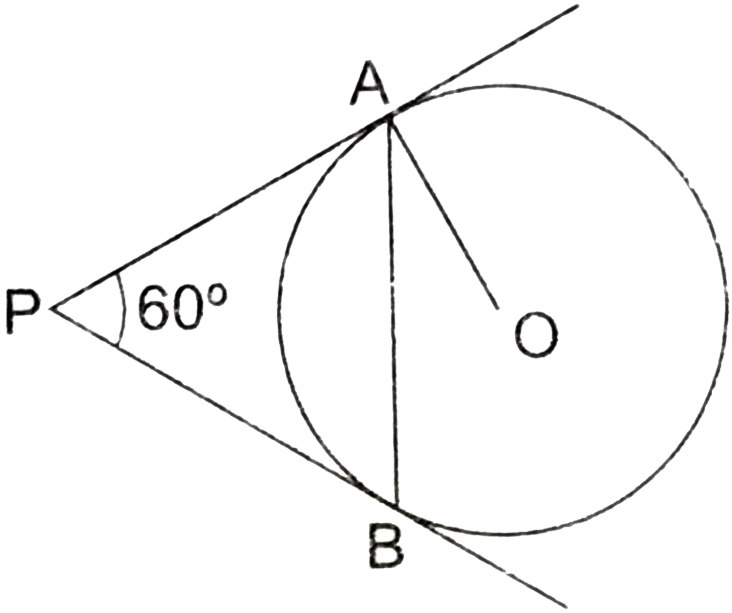
15. In the given figure, PA and PB are two tangetns to the circle with centre O. If

$\angle APB = 60^\circ$ then $\angle OAB$ is



A. 15°

B. 30°

C. 60°

D. 90°

Answer:

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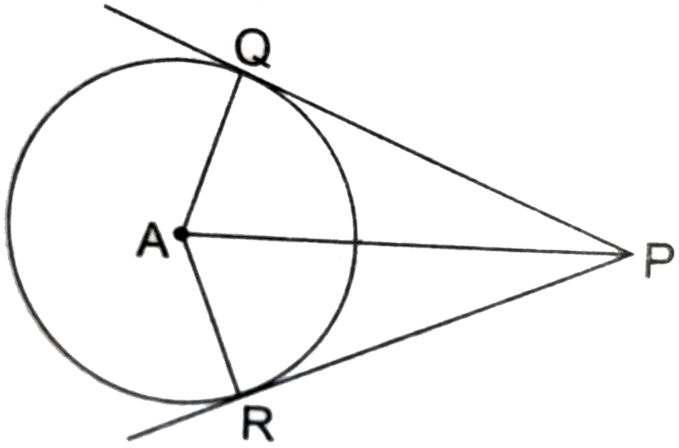
16. In the given figure, PQ and PR are tangents to a circle with centre A. If $\angle QPA = 27^\circ$ then $\angle QAR$ equals



A. 63°

B. 117°

C. 126°

D. 153°

Answer:

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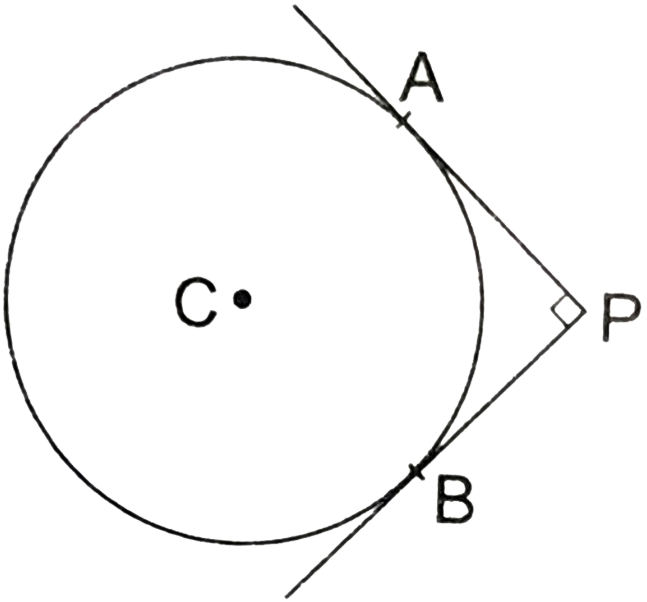
17. In the given figure, PA and PB are two tangents drawn from an external point P to a circle with centre C and radius $4cm$. If

$PA \perp PB$, then the length of each tangent is



A. $3cm$

B. $4cm$

C. $5cm$

D. $6cm$

Answer:

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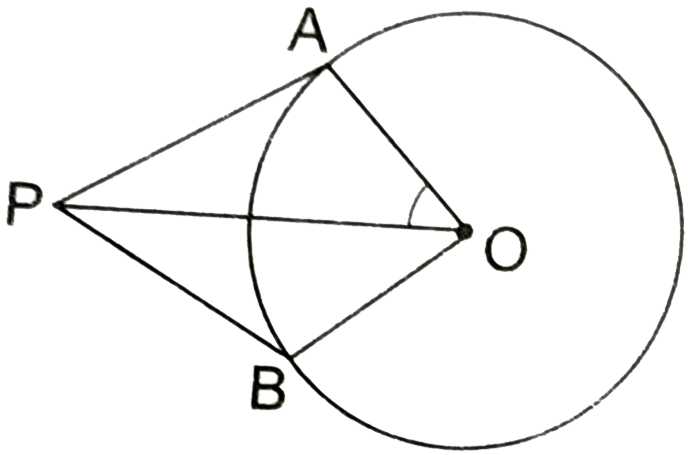
18. If PA and PB are two tangents to a circle with centre O such that $\angle APB = 80^\circ$. Then, $\angle AOP = ?$



A. 40°

B. 50°

C. 60°

D. 70°

Answer:

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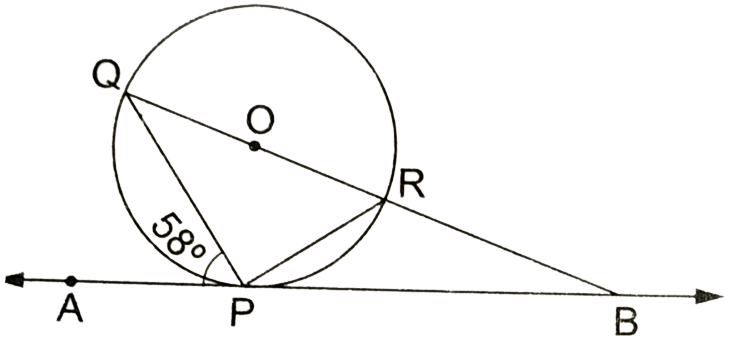
19. In the given figure, O is the centre of the circle. AB is the tangent to the circle at the point P. If $\angle APQ = 58^\circ$ then the measure of

$\angle PQB$ is



A. 32°

B. 58°

C. 122°

D. 132°

Answer:

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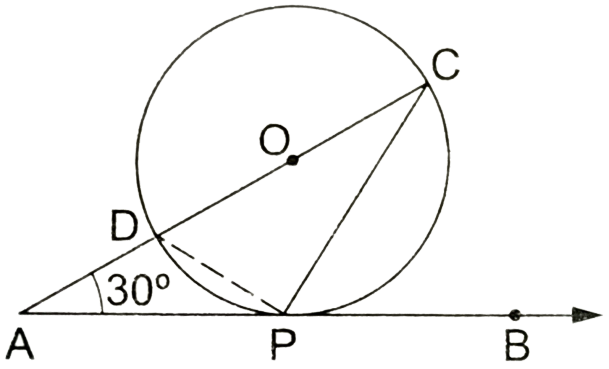
20. In the given figure, O is the centre of the circle. AB is the tangent to the circle at the point P. If $\angle PAO = 30^\circ$ then $\angle CPB + \angle ACP$ is equal to



A. 60°

B. 90°

C. 120°

D. 150°

Answer:

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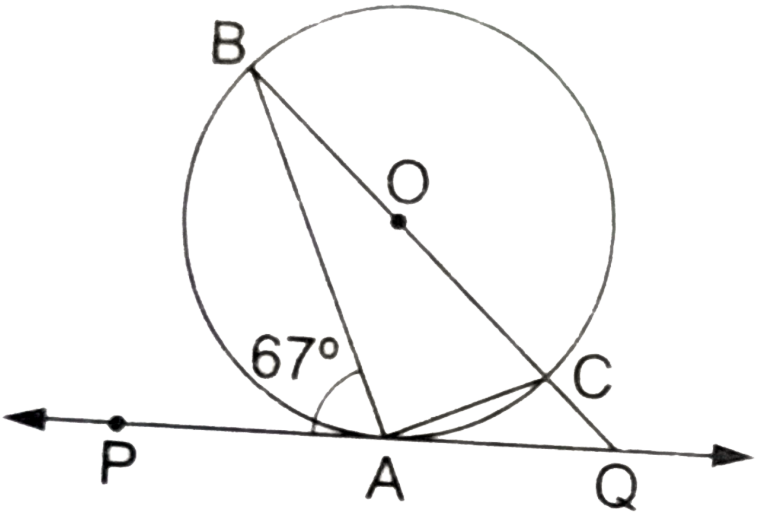
21. In the given figure, PQ is a tangent to a circle with centre O. A is the point of contact. If

$\angle PAB = 67^\circ$, then the measure of $\angle AQB$ is



A. 73°

B. 64°

C. 53°

D. 44°

Answer:

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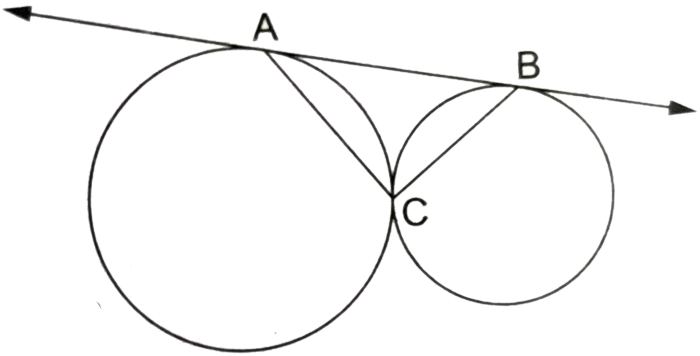
22. In the given figure, two circles touch each other at C and AB is a tangent to both the circles. The mesure of $\angle ACB$ is



A. 45°

B. 60°

C. 90°

D. 120°

Answer:

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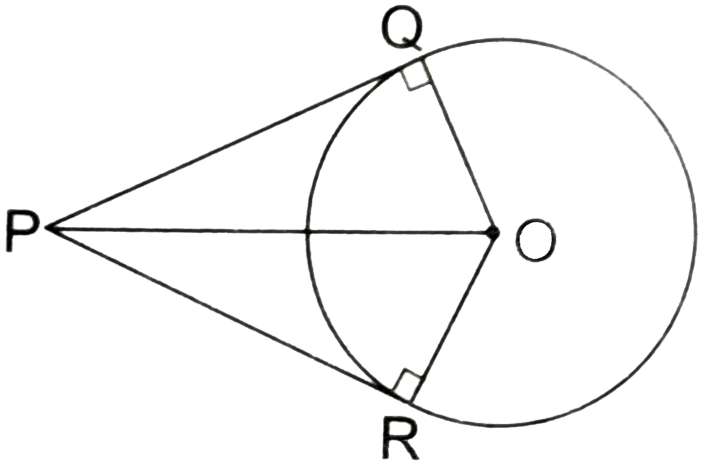
23. O is the centre of a circle of radius $5cm$. At a distance of $13cm$ from O, a point P is taken. From this point, two tangents PQ and PR are

drawn to the circle. Then, the area of quad. $PQOR$ is



A. $60cm^2$

B. $32.5cm^2$

C. $65cm^2$

D. $30cm^2$

Answer:

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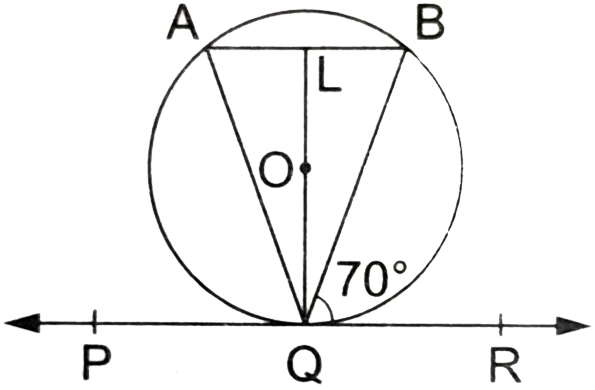
24. In the given figure, PQR is a tangent to the circle at Q, whose centre is O and AB is a chord parallel to PR such that $\angle BQR = 70^\circ$. Then, $\angle AQB = ?$



A. 20°

B. 35°

C. 40°

D. 45°

Answer:

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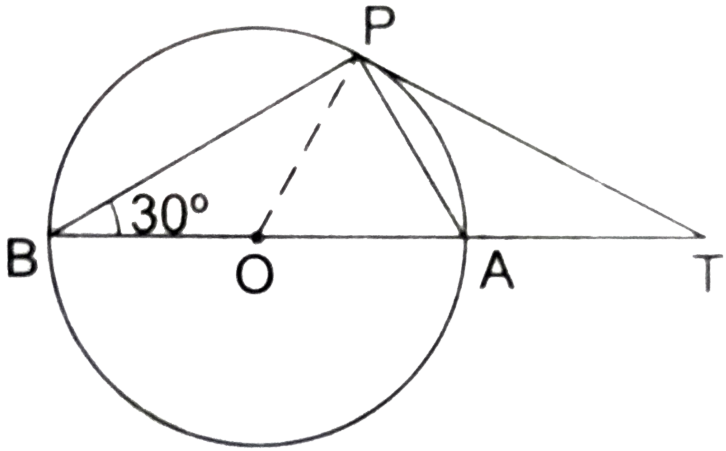
25. In the given figure, O is the centre of a circle, BOA is its diameter and the tangent at the point P meets BA extended at T. If

$\angle PBO = 30^\circ$ then $\angle PTA = ?$



A. 60°

B. 30°

C. 15°

D. 45°

Answer: B

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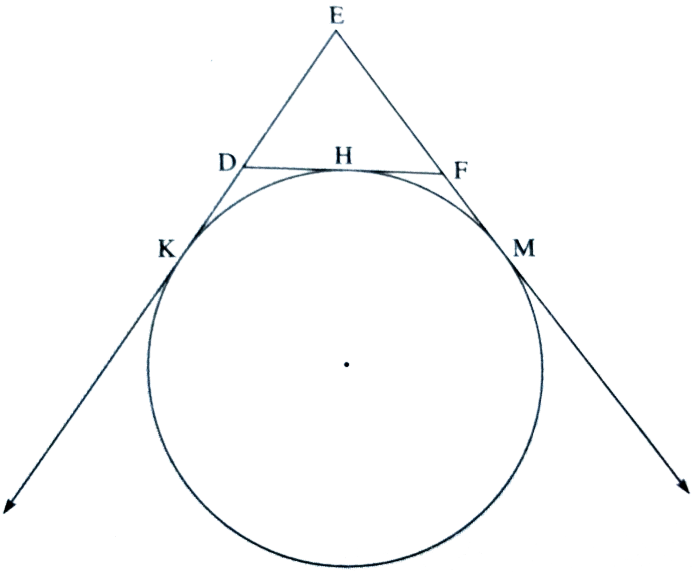
26. In the figure, a circle touches the side DF of $\triangle EDF$ at H and touches line ED and EF at points K and M respectively. If EK =9cm , then perimeter of $\triangle EDF$ is



A. $9cm$

B. $12cm$

C. $13.5cm$

D. $18cm$

Answer:

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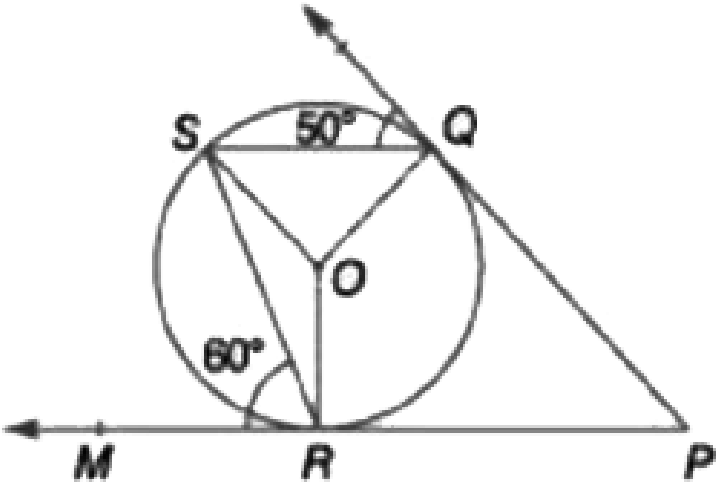
27. In the figure, O is the centre of a circle,PQL and PRM are the tangents at the points Q and R respectively and Sis a point on the circle such

that $\angle SQL = 50^\circ$ and $\angle SRM = 60^\circ$. Then , $\angle QSR$ is equal to



A. 40°

B. 50°

C. 60°

D. 70°

Answer:

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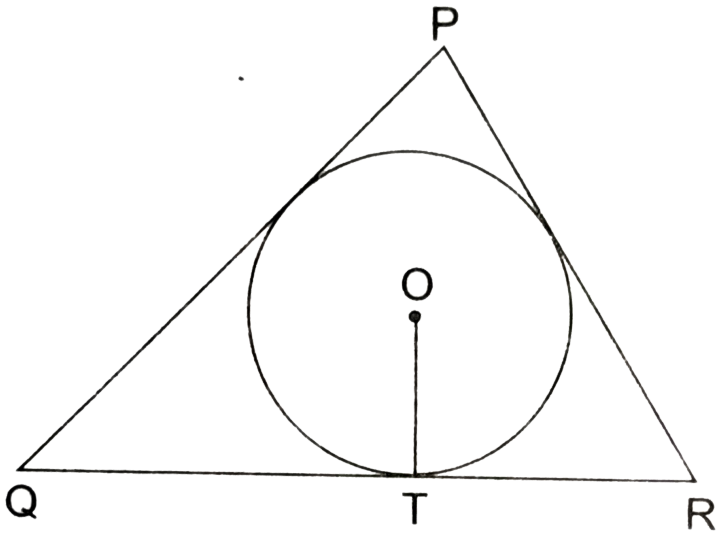
28. In the given figure, a triangle PQR is drawn to circumscribe a circle of radius $6cm$ such that the segments QT and TR into which QR is divided by the point of contact T, are of lengths $12cm$ and $9cm$ respectively. If the area of

$\Delta PQR = 189cm^2$ then the length of side PQ is



A. $17.5cm$

B. $20cm$

C. $22.5cm$

D. $25cm$

Answer:

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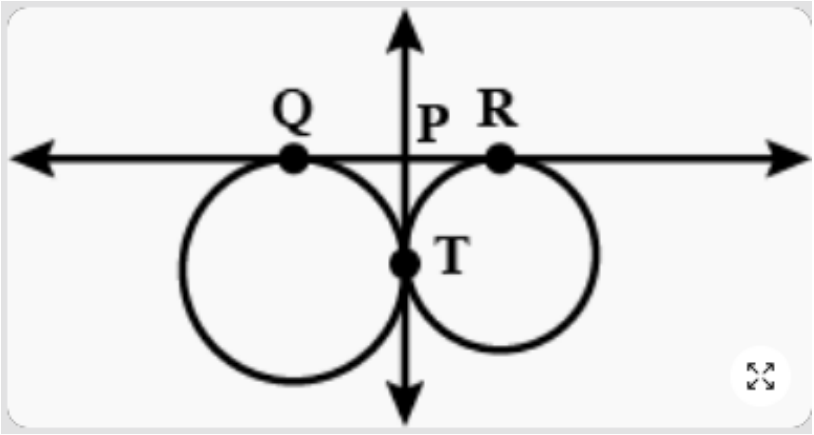
29. In the given figure, QR is a common tangent to the given circles, touching externally at the point T. The tangent at T meets QR at P. If $PT = 3.8cm$ then the length of QR is



A. $1.9cm$

B. $3.8cm$

C. $5.7cm$

D. $7.6cm$

Answer: D

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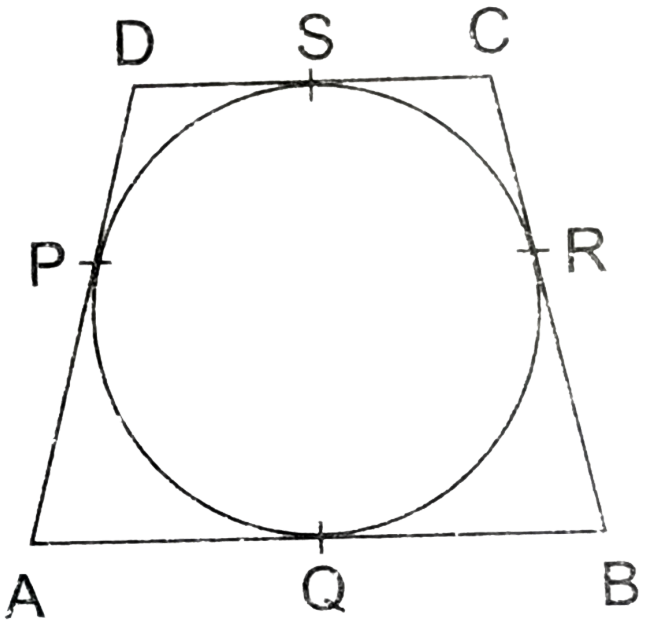
30. In the given figure, quad. $ABCD$ is circumscribed, touching the circle at P, Q, R and S. If $AP = 5cm$,$BC = 7cm$ and $CS = 3cm$.

Then, the length $AB = ?$



A. $9cm$

B. $10cm$

C. $12cm$

D. $8cm$

Answer:

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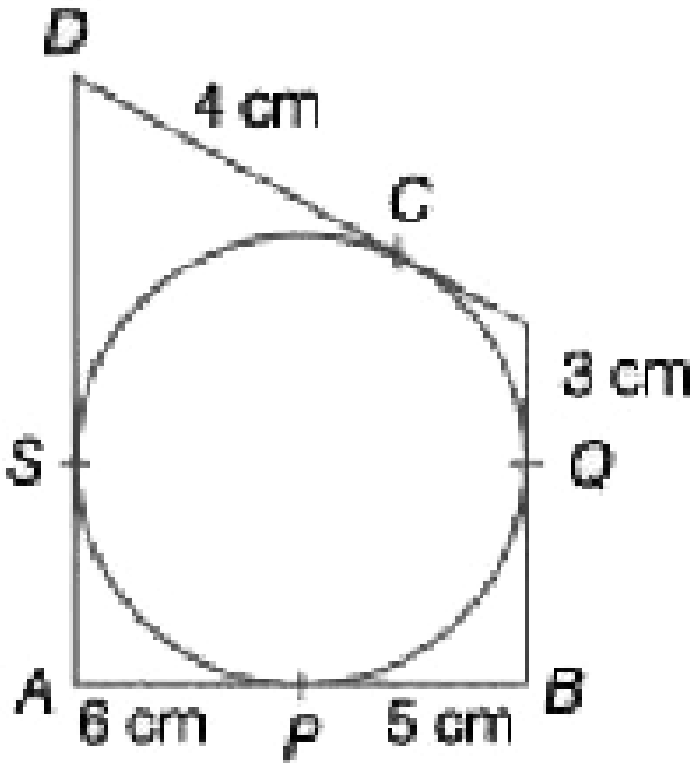
31. In the given figure, quadrilateral ABCD is circumscribed, touching the circle at P, Q, R and S. If AP = 6 cm, BP = 5 cm, CQ = 3 cm and DR = 4

cm, then perimeter of quadrilateral ABCD is



A. $18cm$

B. $27cm$

C. $36cm$

D. $32cm$

Answer:

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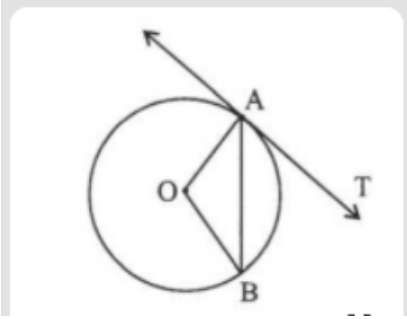
32. In the given figure, O is the centre of a circle , AB is a chord and AT is the tangent at A. If

$\angle AOB = 100^\circ$ then $\angle BAT$ is equal to



A. 40°

B. 50°

C. 90°

D. 100°

Answer: B

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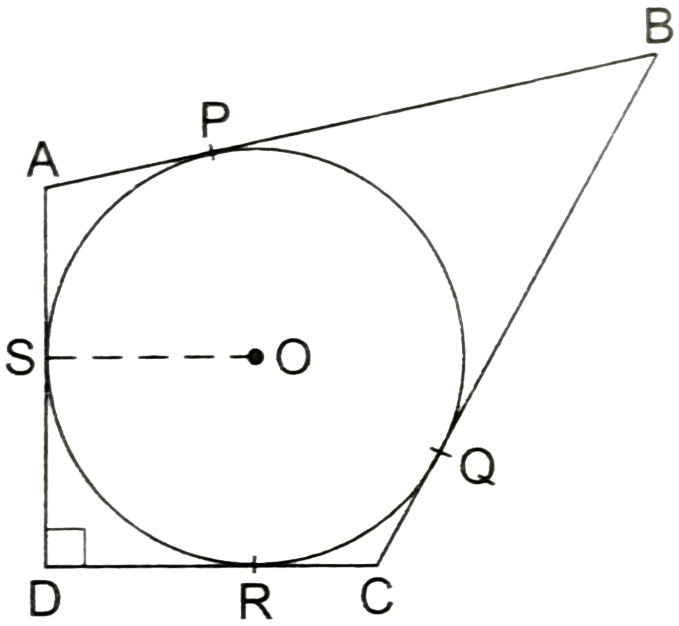
33. In the given figure, a circle is inscribed in a quadrilateral $ABCD$ touching its sides AB, BC, CD and AD at P, Q, R and S respectively. If the radius of the circle is $10cm$, $BC = 38cm$, $PB = 27cm$ and $AD \perp CD$ then the length of

CD is



A. $11cm$

B. $15cm$

C. $20cm$

D. $21cm$

Answer:

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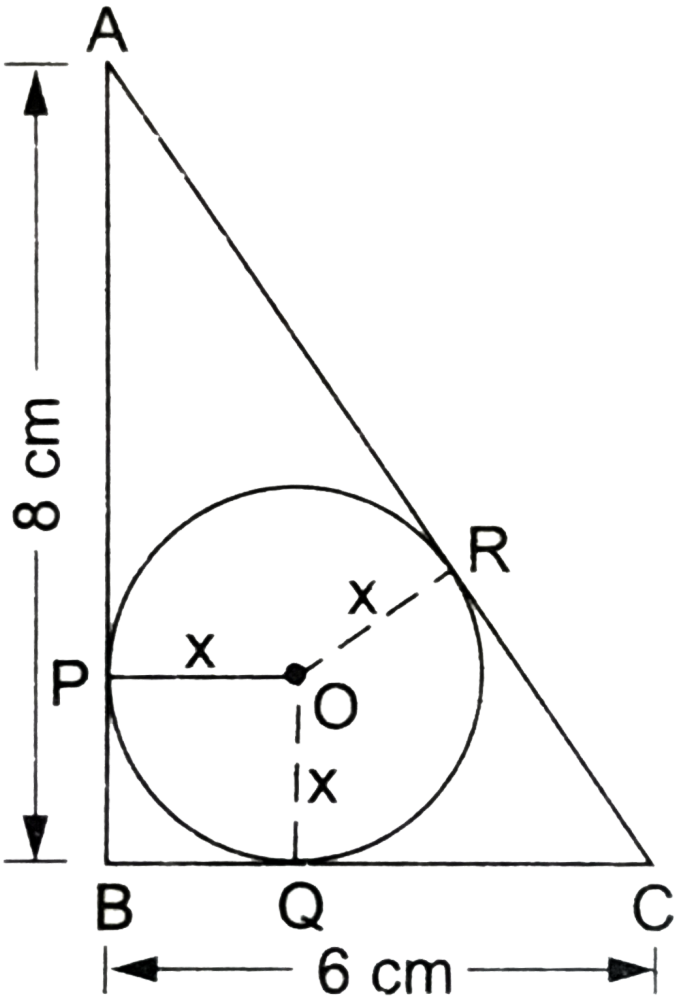
34. In the given figure, ΔABC is right-angled at B such that $BC = 6cm$ and $AB = 8cm$. A circle with centre O has been inscribed inside the triangle. $OP \perp AB$, $OQ \perp BC$ and $OR \perp AC$.

If $OP = OQ = OR = xcm$ then $x = ?$



A. $2cm$

B. $2.5cm$

C. $3cm$

D. $3.5cm$

Answer:

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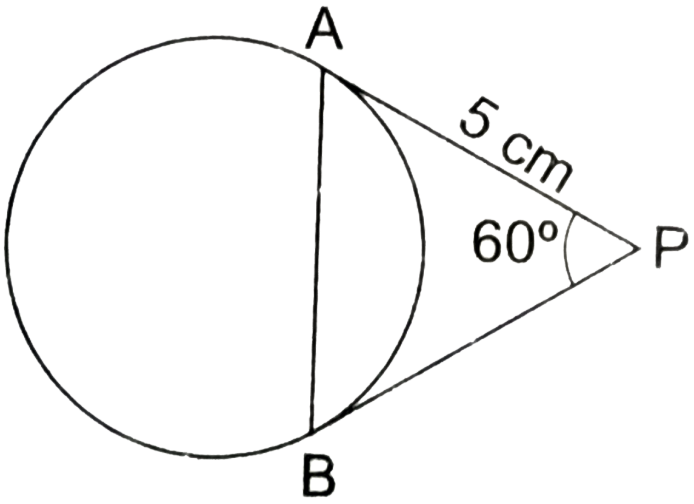
35. In the given figure, PA and PB are tangents to the given circle such that $PA = 5cm$ and

$\angle APB = 60^\circ$. The length of chord AB is



A. $5\sqrt{2}cm$

B. $5cm$

C. $5\sqrt{3}cm$

D. $7.5cm$

Answer:

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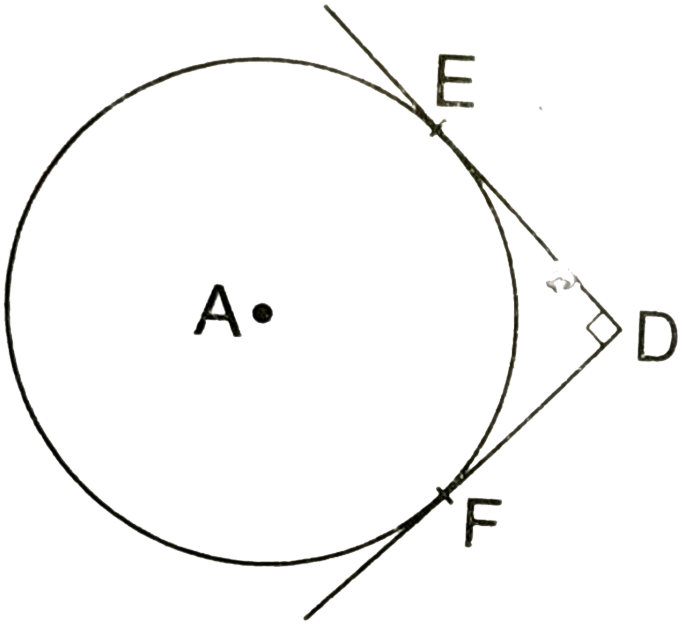
36. In the given figure, DE and DF are tangents from and external point D to a circle with centre A. If $DE = 5cm$ and $DE \perp DF$ then the radius

of the circle is



A. $3cm$

B. $4cm$

C. $5cm$

D. $6cm$

Answer:

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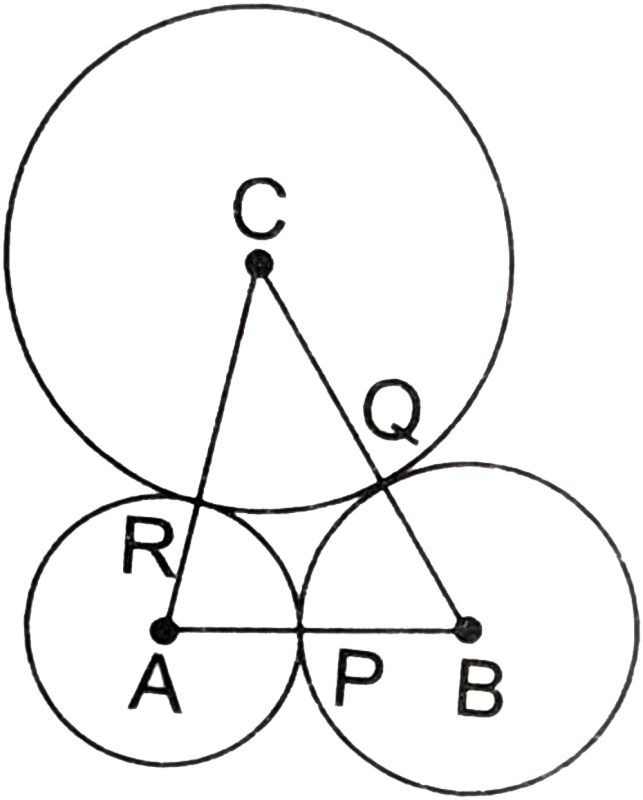
37. In the given figure, three circles with centres A, B, C respectively touch each other externally. If $AB = 5cm$, $BC = 7cm$ and $CA = 6cm$ then

the radius of the circle with centre A is



A. $1.5cm$

B. $2cm$

C. $2.5cm$

D. $3cm$

Answer:

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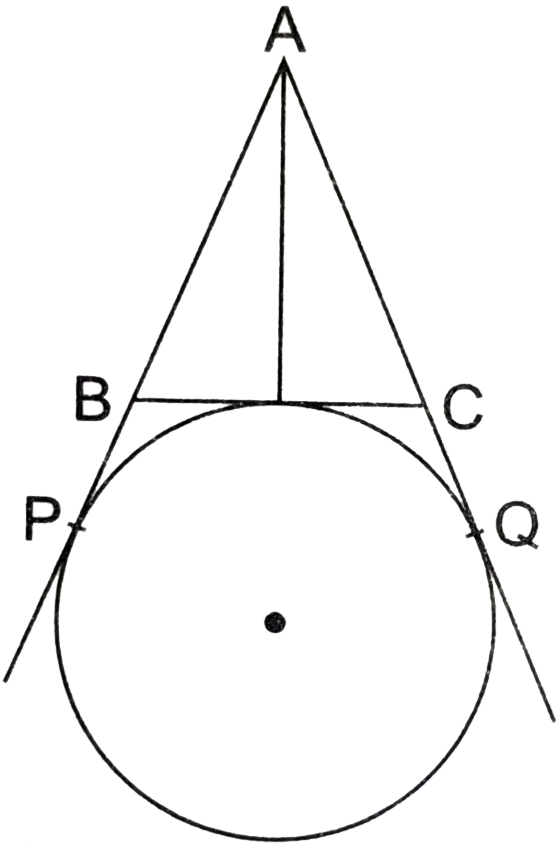
38. In the given figure, AP, AQ and BC are tangents to the circle. If $AB = 5cm$, $AC = 6cm$

and $BC = 4cm$ then the length of AP is



A. $15cm$

B. $10cm$

C. $9cm$

D. $7.5cm$

Answer:

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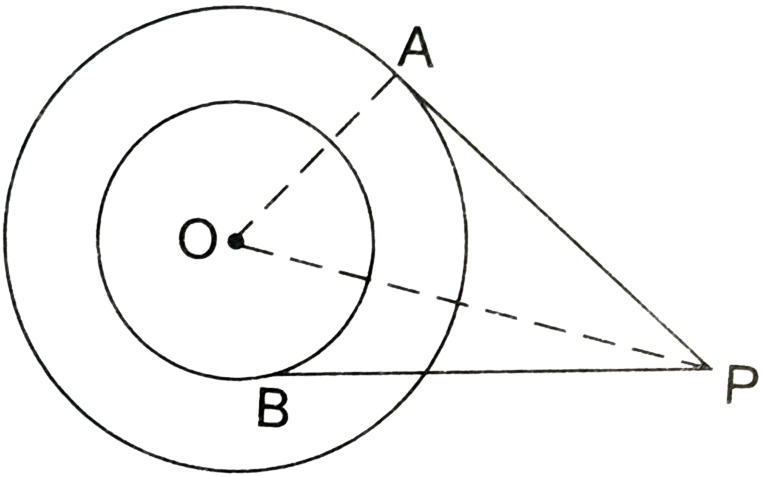
39. In the given figure, O is the centre of two concentric circles of radii $5cm$ and $3cm$. From an external point P tangents PA and PB are drawn to these circles. If $PA = 12cm$ then PB

is equal to



A. $5\sqrt{2}cm$

B. $3\sqrt{5}cm$

C. $4\sqrt{10}cm$

D. $5\sqrt{10}cm$

Answer:

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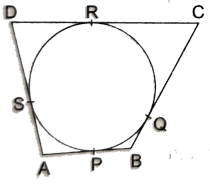
Assertion And Reason

1. Assertion (A) In the given figure, a quad. $ABCD$ is drawn to circumscribe a given circle, as shown

Then, $AB + BC = AD + DC$.

Assertion (A)	Reason (R)
In the given figure, a quad. $ABCD$ is drawn to circumscribe a given circle, as shown. Then, $AB + BC = AD + DC$. 	In two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.

Reason (R) In two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.

A. Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Asseration (A).

B. Both Assertion (A) and Reason (R) are true but Reason (R) is not a correct explanation of Asseration (A).

C. Assertion(A) is true and Reason (R) is false.

D. Assertion(A) is false and Reason (R) is true.

Answer:

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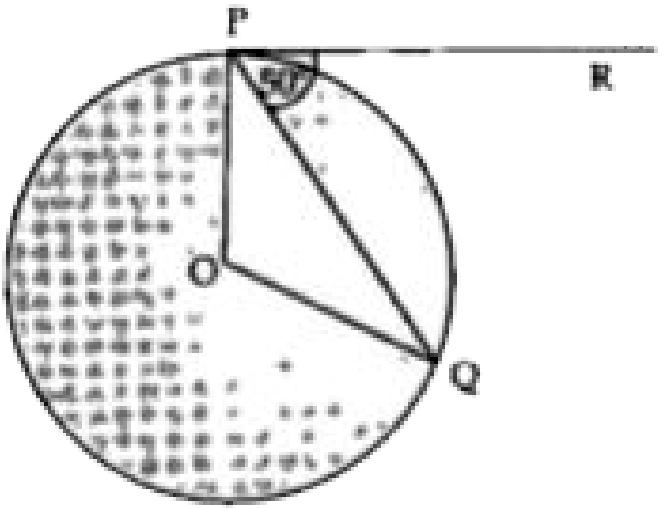
Test Yourself

1. In the given figure ,'O is the centre of circle ,PQ is a chord and the tangent PR at P makes an angle of 50° with PQ ,then $\angle POQ$ is equal to :



A. 130°

B. 100°

C. 90°

D. 75°

Answer: B

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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°

Answer: C

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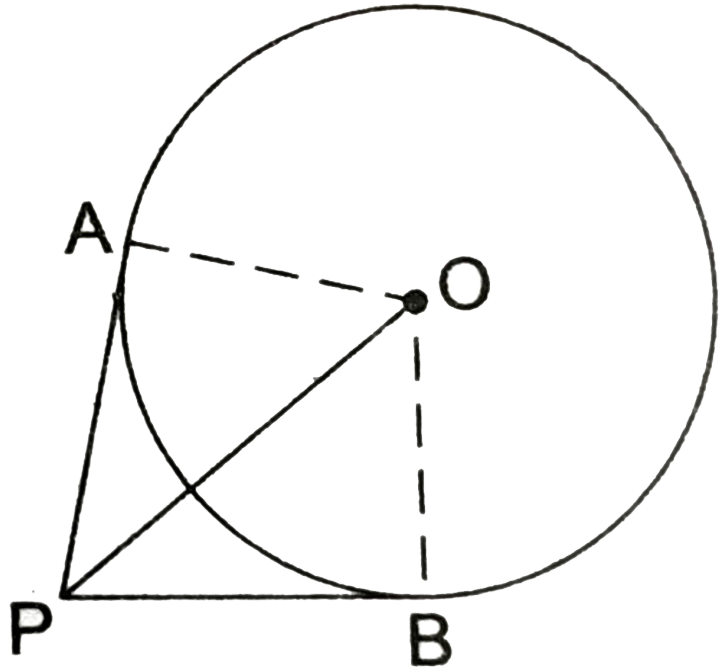
3. If tangents PA and PB from a point P to circle with centre O drawn so that

$\angle APB = 80^\circ$ then $\angle POA = ?$



A. 40°

B. 50°

C. 80°

D. 60°

Answer:

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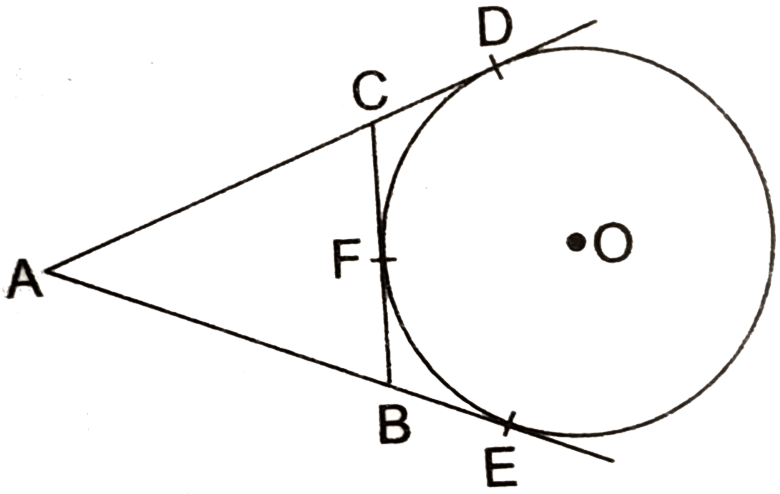
4. In the given figure, AD and AE are the tangents to a circle with centre O and BC touches the circle at F. If $AE = 5cm$ then

perimeter of ΔABC is



A. $15cm$

B. $10cm$

C. $22.5cm$

D. $20cm$

Answer:

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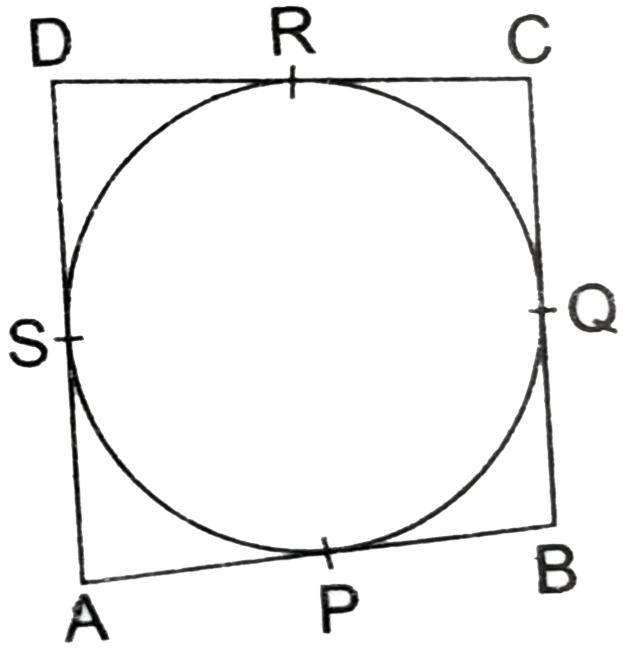
5. In the given figure, a quadrilateral $ABCD$ is drawn to circumscribe a circle such that its sides AB, BC, CD and AD touch the circle at P, Q, R and S respectively. If $AB = xcm$,

$BC = 7cm, CR = 3cm$ and $AS = 5cm$, find x.



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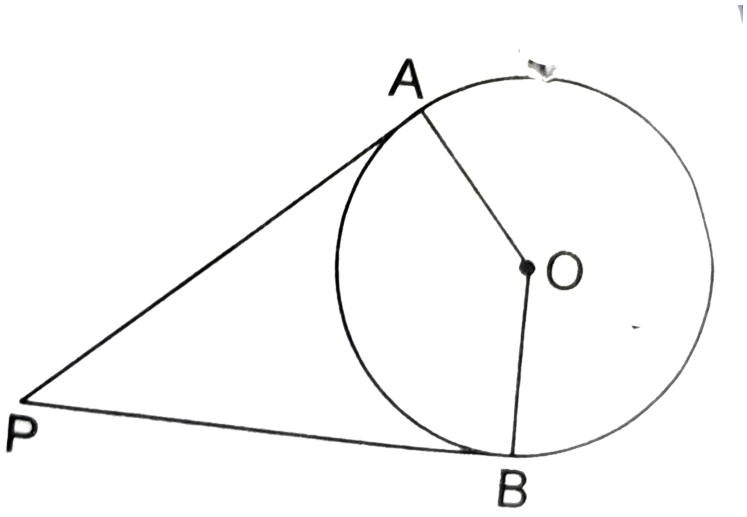
6. In the given figure, PA and PB are the tangents to a circle with centre O. Show that the

points A, O, B, P are concyclic.



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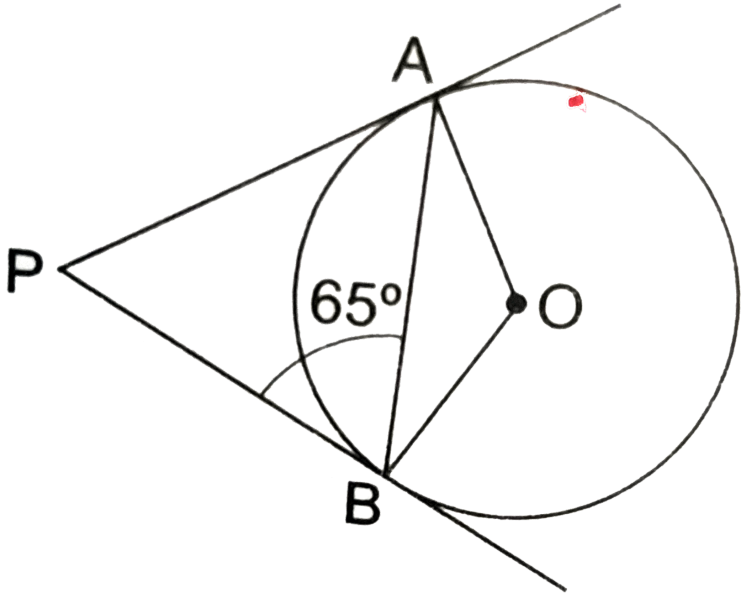
7. In the given figure, PA and PB are two tangents from an external point P to a circle with centre O. If $\angle PBA = 65^\circ$, find $\angle OAB$ and

$\angle APB.$



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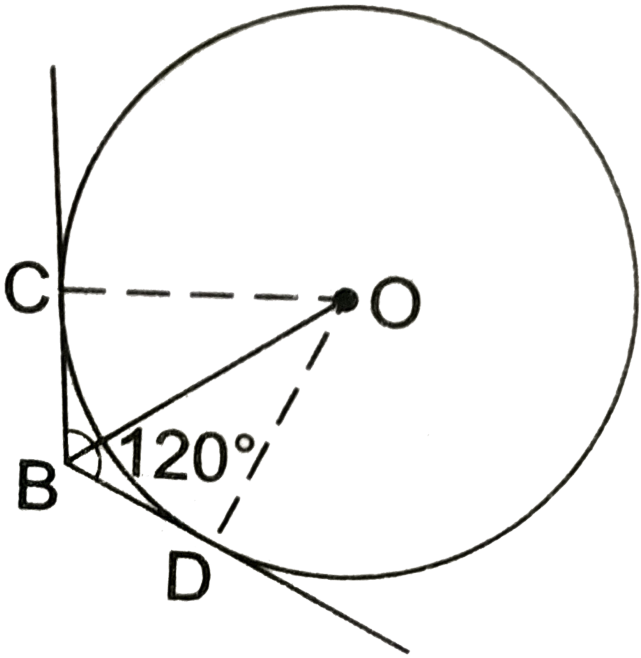
8. Two tangent segments BC and $BD$are drawn to a circle with centre O such that

$\angle CBD = 120^\circ$. Prove that $OB = 2BC$.



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9. Fill in the blanks

(i) A line intersecting a circle in two distinct

points is caled 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.

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10. Prove that the length of the tangents drawn from an external point to a circle are equal.

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11. Prove that the tangents drawn at the ends of the diameter of a circle are parallel.

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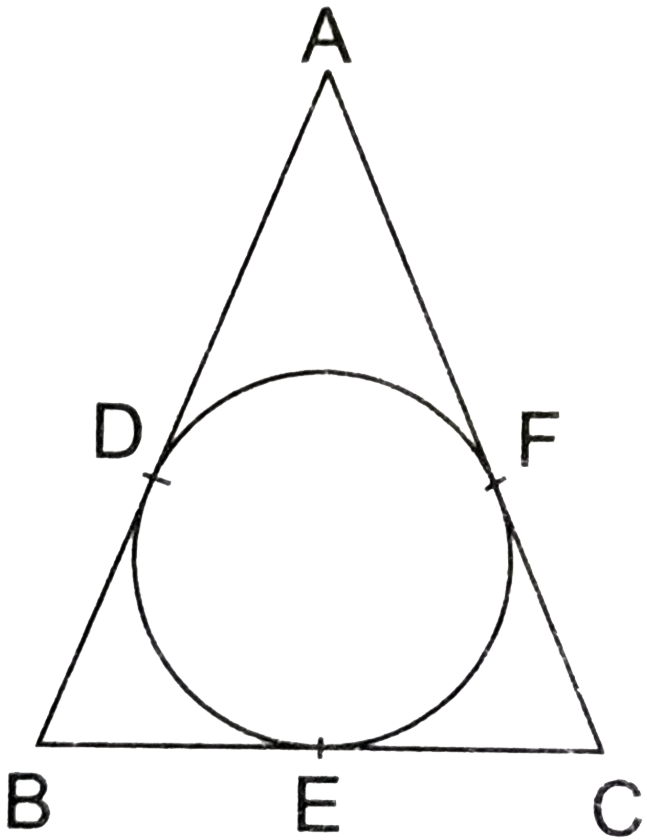
12. In the given figure, if $AB = AC$, prove that $BE = CE$.



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13. Theorem:If two tangents are drawn to a circle from an external point ; then (i) they subtend equal angles at the centre. (ii) they are equally inclined to the line segments ; joining the centre to that point.

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14. Prove that the tangents drawn at the end points of a chord of a circle make equal angles with the chord.

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15. सिद्ध कीजिए कि किसी वृत्त के परिगत समांतर चतुर्भुज समचतुर्भुज होता है ।

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16. Two concentric circles are of radii $5cm$ and $3cm$ respectively. Find the length of the chord of the larger circle which touches the smaller circle.

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17. एक वृत्त के परिगत एक चतुर्भुज ABCD खींचा गया है सिद्ध कीजिए

$$AB + CD = AD + BC$$

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18. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

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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.

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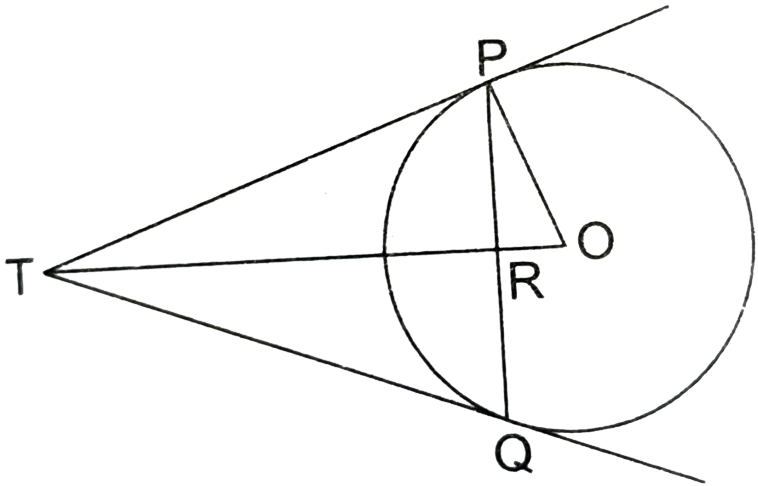
20. PQ is a chord of length $16cm$ of a circle of radius $10cm$. The tangents at P and Q intersect at a point T as shown in the figure. Find the

length of TP.



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