MATHS

BOOKS - VK GLOBAL PUBLICATION MATHS (HINGLISH)

CIRCLES

Very Short Answer Questions

1. If a point P is 17 cm from the centre of a circle of radius 8 cm, then find the length of

the tangent drawn to the circle from point P.

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Very Short Answer Questions 1 Marks

1. 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.

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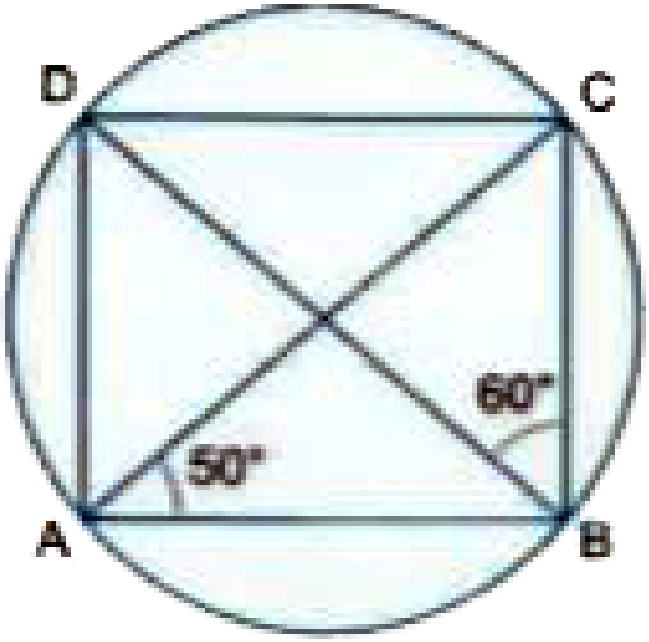
2. In Fig , ABCD is a cyclic quadrilateral . If $\angle BAC = 50^\circ$ and $\angle DBC = 60^\circ$ then find $\angle BCD$.



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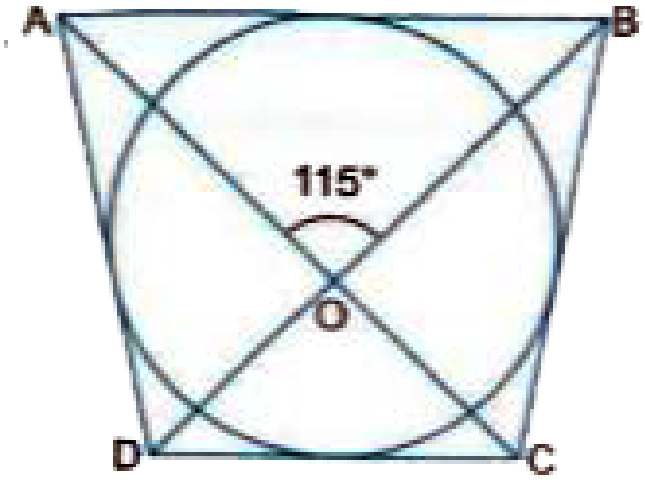
3. In Fig the quadrilateral ABCD circumscribes a circle with centre O. If $\angle AOB = 115^\circ$, then find $\angle AOB = 115^\circ$ then find $\angle COD$.



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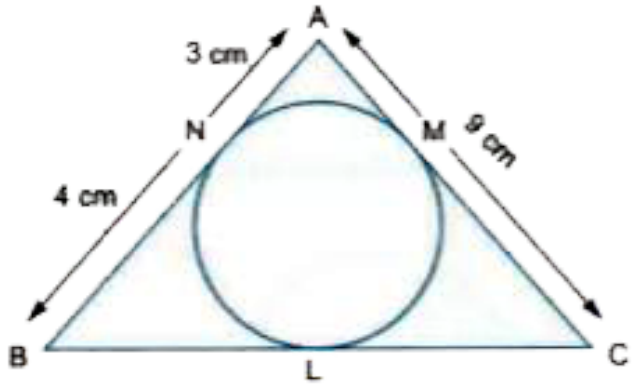
4. In Fig , ΔABC is circumscribing a circle. Find the length of BC.



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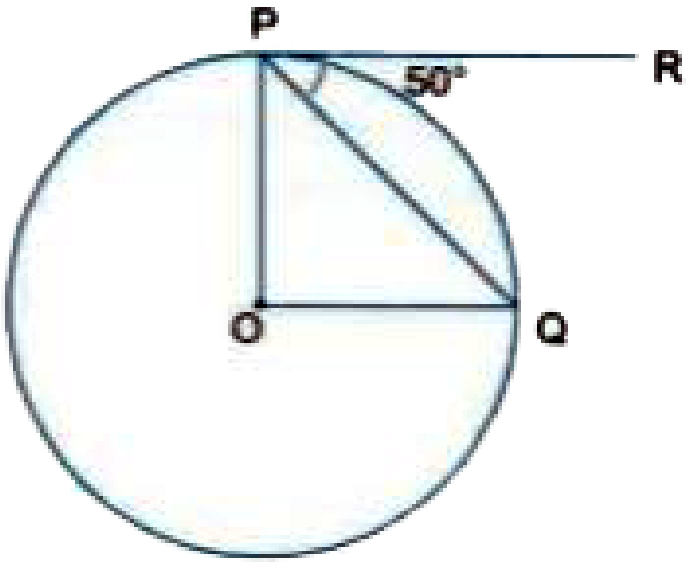
5. In Fig , O is the centre of a circle , PQ is a chord and the tangent PR at P makes an angle

of 50° with PQ. Find $\angle POQ$.



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

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7. If radii of two concentric circles are 4 cm and 5 cm, then length of each chord of one circle which is tangent to the other circle, is

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8. 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 $\angle POR = 120o$, then $\angle OPQ$ is $60o$ (b) $45o$ (c) $30o$ (d) $90o$

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9. From the external point P tangents PA and PB are drawn to a circle with centre O. If $\angle PAB = 50^\circ$, then find $\angle AOB$.

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10. PQ is a tangent at a point C to a circle with centre O if AB is a diameter and angle $CAB = 30^\circ$, find angle PCA.

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Short Answer Questions I 2 Marks

1. AB is a diameter of a circle and AC is its chord such that $\angle BAC = 30^\circ$. If the tengent at C intersects AB extended at D, then BC=BD.

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2. The length of tangent from an external point P on a circlewith centre 0 is always less than OP.

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3. If angle between two tangents drawn from a point P to a circle of radius a and centre 0 is 90° then $OP = a\sqrt{2}$.

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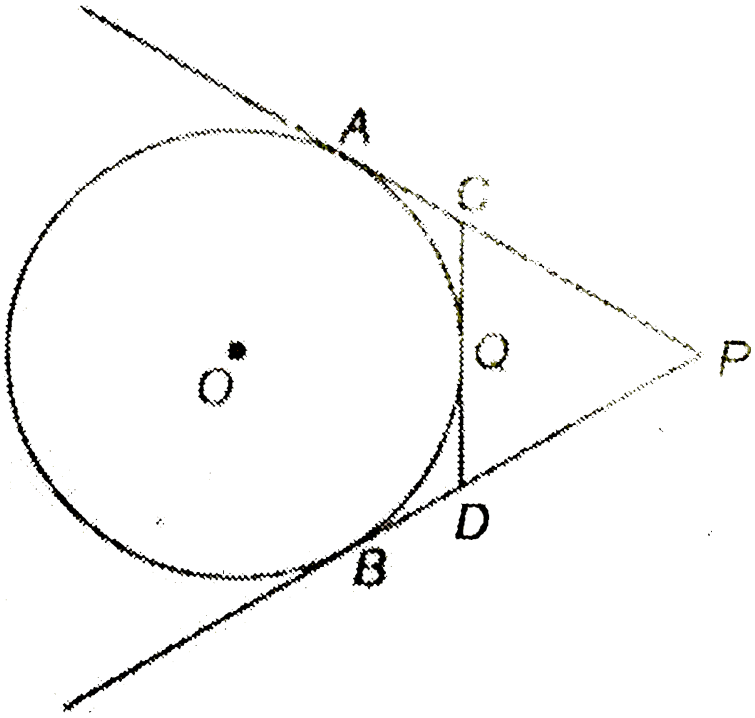
4. In the given figure, PA and PB are tangents to the circle from an external point P. CD is another tangent touching the circle at Q. If PA =12 cm, QC=3cm, then find PC+PD.



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5. 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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6. 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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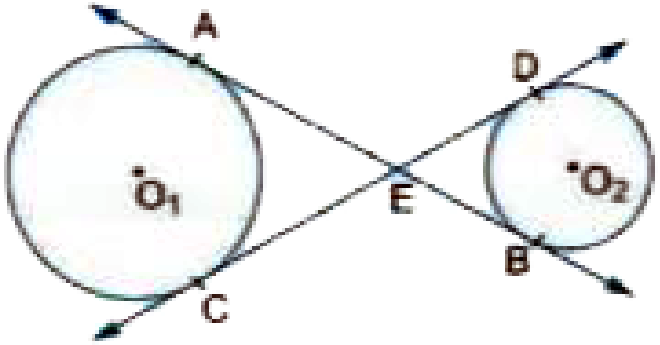
7. In Fig common tangents AB and CD to two circles with centres O_1 and O_2 intersect at E. Prove that AB = CD.



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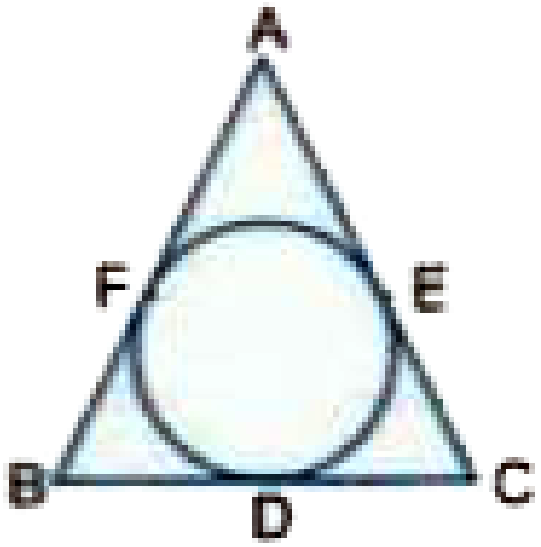
8. The incircle of an isosceles triangle ABC, in which AB = AC, touches the sides BC, CA and AB at D, E and F respectively . Prove that BD = DC.



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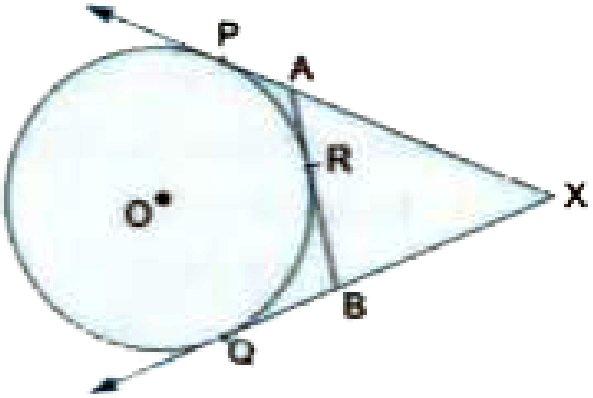
9. In Fig , XP and XQ are two tangents to the circle with centre O , drawn from an external point X . ARB is another tangent, touching the circle at R . Prove that XA + AR = XB + BR.



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10. 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= 12 cm, BC= 8 cm and AC = 10 cm, find the lengths of AD, BE and CF.

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11. In Fig.2, a quadrilateral ABCD is drawn to circumscribe a circle, with centre O, in such a way that the sides AB, BC, CD and DA touch the

circle at the points P, Q, R and S respectively. Prove that AB + CD = BC + DA.

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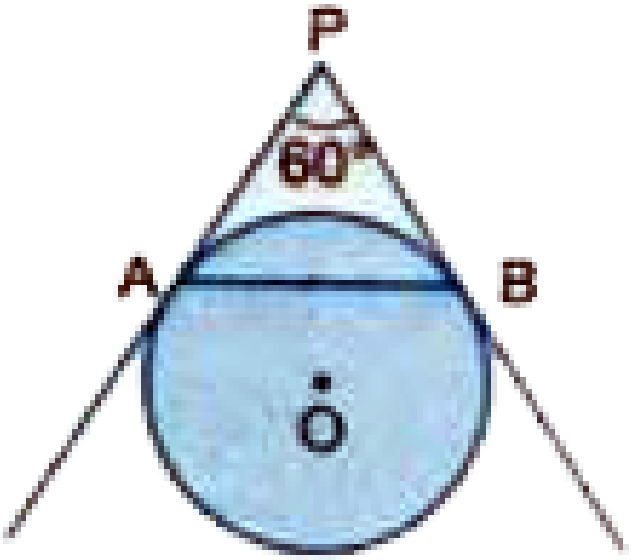
12. In Fig AP and BP are tangents to a circle with centre O, such that AP = 5 cm , and

$\angle APB = 60^\circ$. Find the length of chord AB.



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13. From an external point P, two tangents PT and PS are drawn to a circle with centre O and

radius r. if OP=2r, show that

$\angle OTS = \angle OST = 30^\circ$

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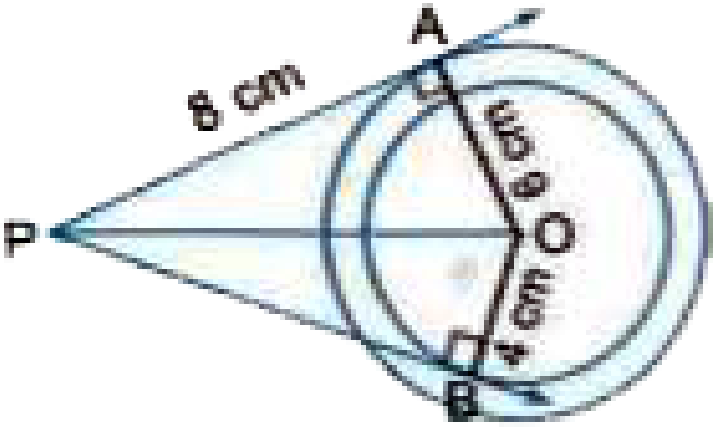
14. In Fig , are two concentric circles of radii 6 cm and 4 cm with centre O . If AP is a tangent to the larger circle and BP to the smaller circle

and length of AP is 8 cm, find the length of BP.



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Short Answer Questions Ii 3 Marks

1. Tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a

point Q so that OQ = 12 cm. Find length of PQ

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2. 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.

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3. In Fig. 10.11, if TP and TQ are the two tangents to a circle with centre O so that

$\angle POQ = 110o$, then $\angle PTQ$is equal to

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

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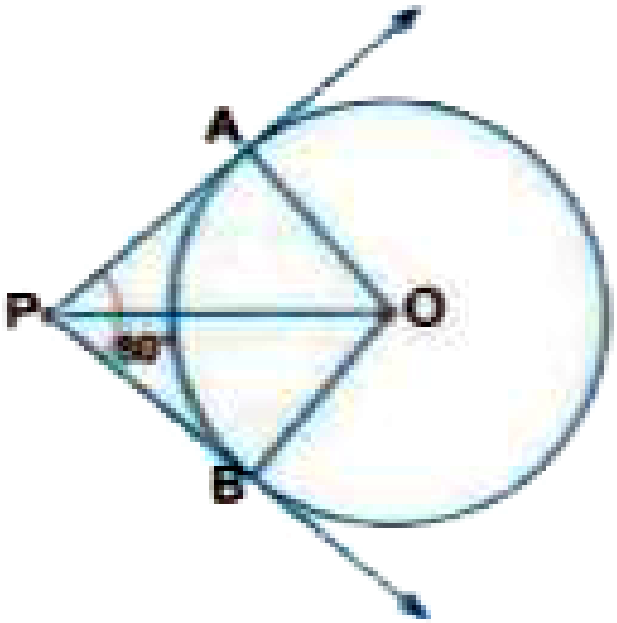
5. If tangents PA and PB from a point P to a circle with centre O are inclined to each other

at angle of 80° , then find $\angle POA$.



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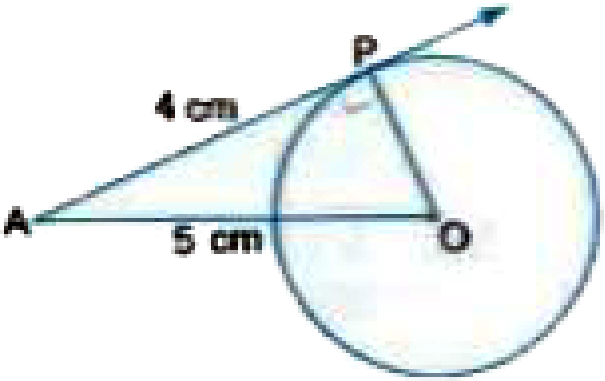
6. The length of a tangent from a point A at distance 5 cm from the centre of the circle is 4

cm . Find the radius of the circle.



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7. 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.

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

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10. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$

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11. Type II: 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=1/2(Perimeter of ΔABC)

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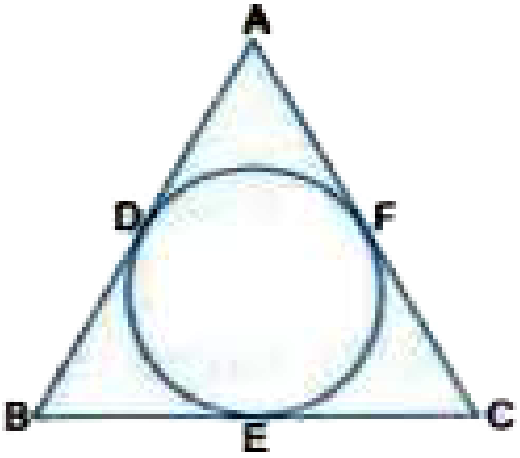
12. In Fig , if AB = AC , prove that BE = EC .



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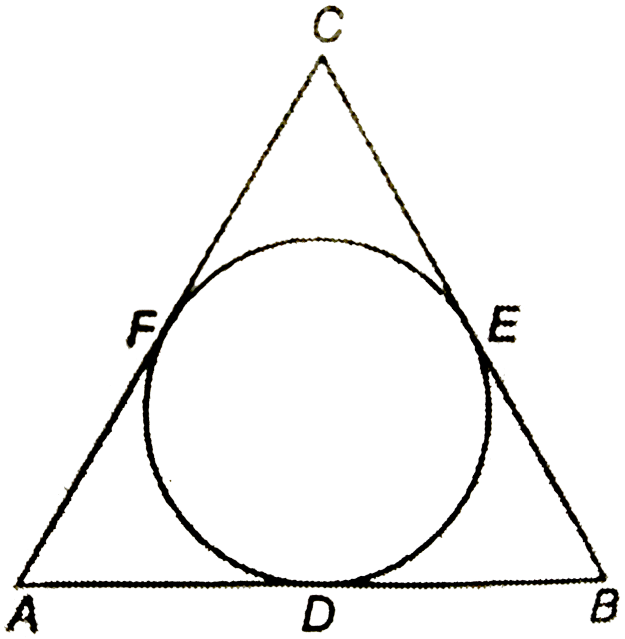
13. A circle is inscribed in a $\triangle ABC$ having sides 8 cm, 10 cm and 12 cm as shown in figure.

Find AD, BE and CF.



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Long Answer Questions 4 Marks

1. Theorem: A tangent to a circle is perpendicular to the radius through the point of contact.

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

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3. Prove that the parallelogram circumscribing a circle is a rhombus.

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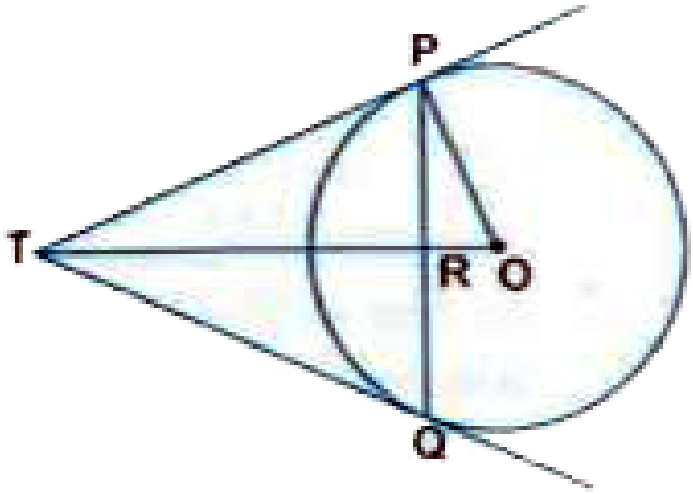
4. In Fig , PQ is a chord of length 16 cm, of a radius 10 cm . The tangents at P and Q

intersect at a point T. Find the length of TP.



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5. 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 $\angle POR = 120o$, then $\angle OPQ$ is $60o$ (b) $45o$ (c) $30o$ (d) $90o$

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6. . In the given figure, two equal circles, with centres O and O', touch each other at X. OO' produced me the circle with centre O' at A. AC is tangent to the circle with centreO, at the point C. O'D is perpendicular to AC. Find the value of $\frac{DO'}{CO}$.

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

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Hots Higher Order Thinking Skills

1. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary

angles at the centre of the circle.

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

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3. In Fig. 10.13, 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 $\angle AOB = 90o$

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4. Let A be one point of intersection of two intersecting circles with centres $OandQ$. The tangents at A to the two circls meet the

circles again at $BandC$, respectively. Let the point P be located so that $AOPQ$ is a parallelogram. Prove that P is the circumcentre of the triangle ABC.

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Proficiency Exercise Very Short Answer Questions 1 Mark

1. 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.

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2. At one end A of a diameter AB of a circle of radius 13 cm , tangent ,XAY is drawn to the circle . A chord CD is parallel to XY and is at a distance of 18 cm from A . What will be the length of CD?

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3. If radii of two concentric circles are 12 cm and 13 cm, find the length of each chord of one circle which is tangent to the other circle.

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4. From a point A which is at a distance of 10 cm from the centre O of radius 6 cm, the pair of tangents AB and AC to the circle are drawn. What will be the area of the quadrilateral ABOC?

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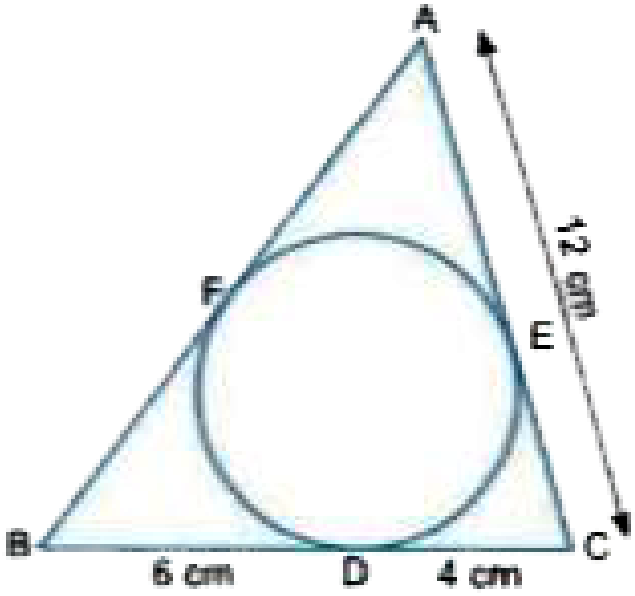
5. In Fig ,ΔABC is circumscribing a circle . Find the length of AB.



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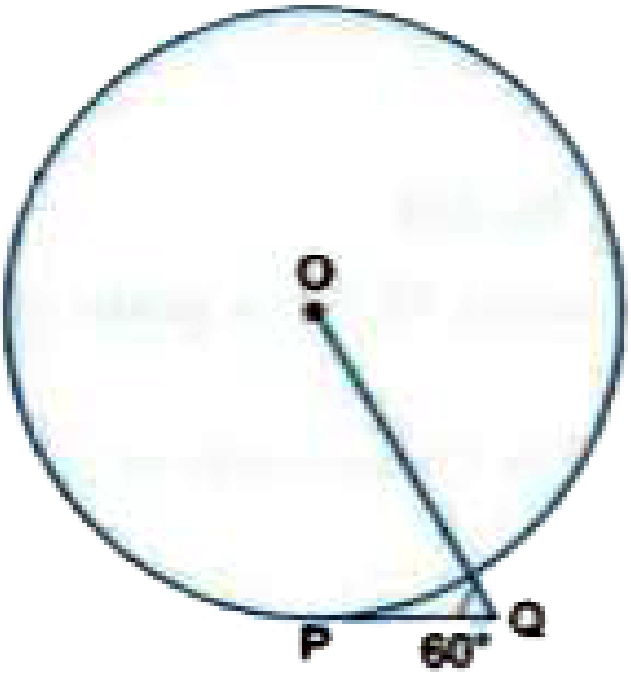
6. In fig. PQ is a tangent to length 6cm to the circle with centre O and $\angle OQP = 60^\circ$. Find OQ



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7. Two equal circles touch each other externally at C and AB is a common tangent to the circles. Then, $\angle ACB =$ $60o$ (b) $45o$ (c) $30o$ (d) $90o$

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8. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 110° , find $\angle POA$.

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9. If angle between two radii of a circle is 80° , what will be the angle . between the tangents at the ends of the radii ?

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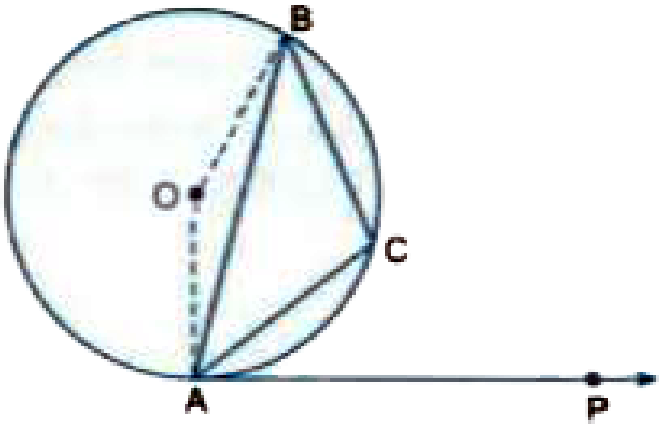
10. In fig AB is chord of a circle with centre O and AP is the tangent at A such that

$\angle BAP = 75^\circ$ find $\angle ACB$



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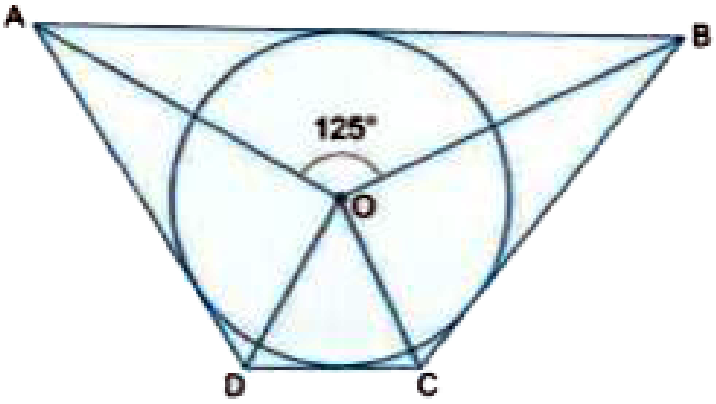
11. In Fig if $\angle AOB = 125^\circ$ them find $\angle COD$.



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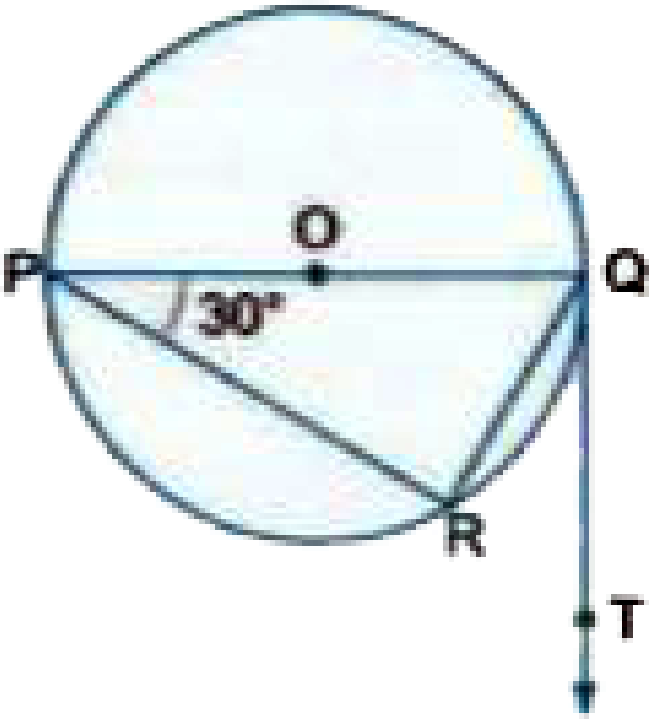
12. In Fig RQ is a chord of the circle and POQ is its diameter such that $\angle RPQ = 30^\circ$. If QT is the tangent to the circle at the point Q them

find $\angle RQT$.



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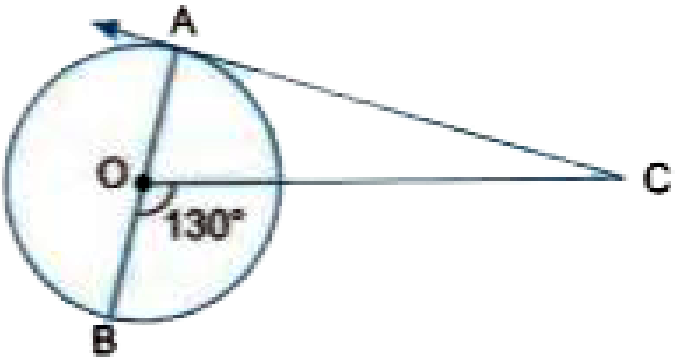
13. If Fig , AOB is diameter of a circle with centre O and AC is a tangent to the circle at A .

If $\angle BOC = 130^\circ$, then find $\angle ACO$.



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Proficiency Exercise Short Answer Questions I 2 Mark

1. In Fig. BOA is a diameter of a circle with centre O and the tangent at a point P meets

BA extended at T . If $\angle ABP = 40^\circ$ then $\angle PTA$ is equal to 40°

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2. If a number of circles touch line segment PQ at a point A then , their centres lie on the perpendicular bisector of PQ. State True or False

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3. If angle between two tangents drawn from a point P to a circle of radius a and centre 0 is 60° then $OP = a\sqrt{3}$.

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4. If a chord PQ subtends an angle of 80° at the centre of a circle, then angle between the tangents at P and Q is also 80°

State true or false

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5. The length of tangent from an external point on a circle is always greater than the radius of the circle.

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6. In Fig. 10.76, CP and CQ are tangents from an external point C to a circle with centre O . AB is another tangent which touches the

circle at R . If $CP = 11cm$ and $BR = 4cm$, find the length of BC . (FIGURE)

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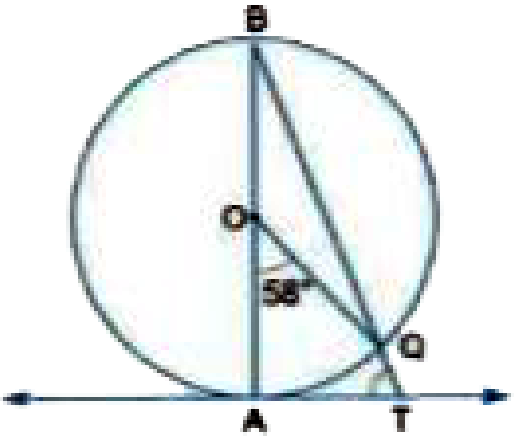
7. In Fig AB is the diameter of a circle O and AT is a length If $\angle AOQ = 58^\circ$, find $\angle ATQ$.



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8. Find the length of the the tangent from the external point P at a distance of 20 cm from the centre of a circle of radius 12 cm.

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9. Two tangents AB and AC are drawn from an external point A to a circle with centre O . If they are inclined to each other at an angle of 100° then what is the value of $\angle BOC$.

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10. The length of tangent from a point A at a distance of 12 cm from the centre of the circle is 9 cm. What is the radius of the circle ?

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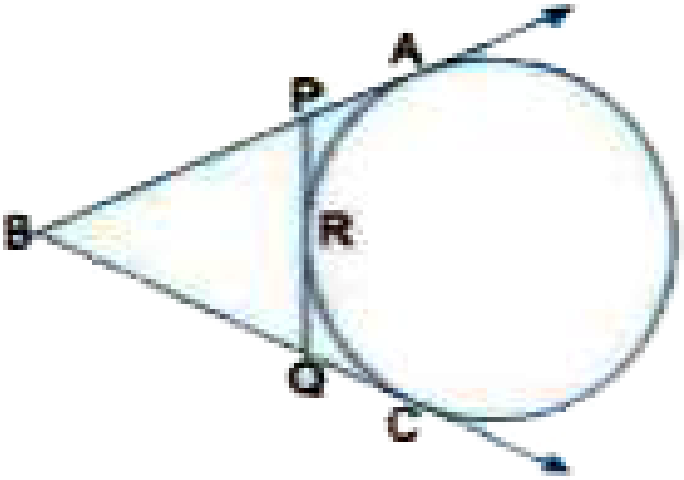
11. In Fig BA and BC are tangents to the circle drawn from an external point B . PQ is a tangent touching the circle at R. If BC = 12 cm and PR = 3 cm, what is the perimeter of

ΔBPQ ?



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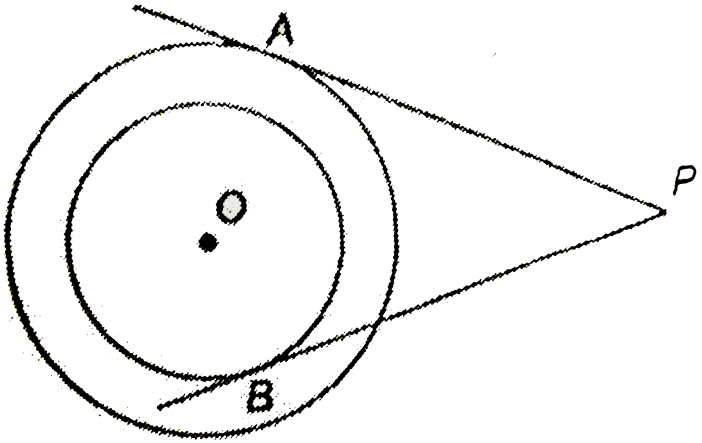
12. In the given figure two concentric circles with centre O are of radii 5 cm and 3 cm. From an external point P, tangents PA and PB are

drawn to these circles. If AP =12 cm find BP.



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13. From an external point P, two tangents $PAandPB$ are drawn to the circle with centre

O. Prove that OP is the perpendicular bisector of AB.

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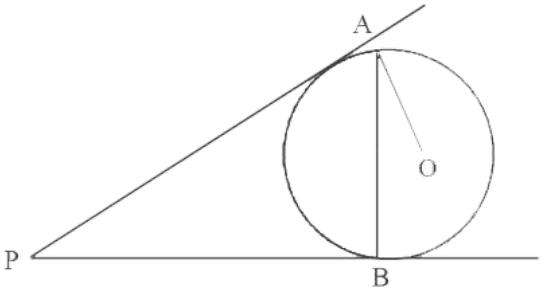
Proficiency Exercise Short Answer Questions Ii 3 Mark

1. 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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2. Two concentric circles area of radii 8cm and 5cm. Find the length of the chord of the length circle which touches the smaller circle.

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3. $\triangle ABC$ is an isosceles triangle in which AB=AC, circumscribed about a circle. Prove that the base is bisccted by the point of contact.

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4. 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 APB is equilateral.

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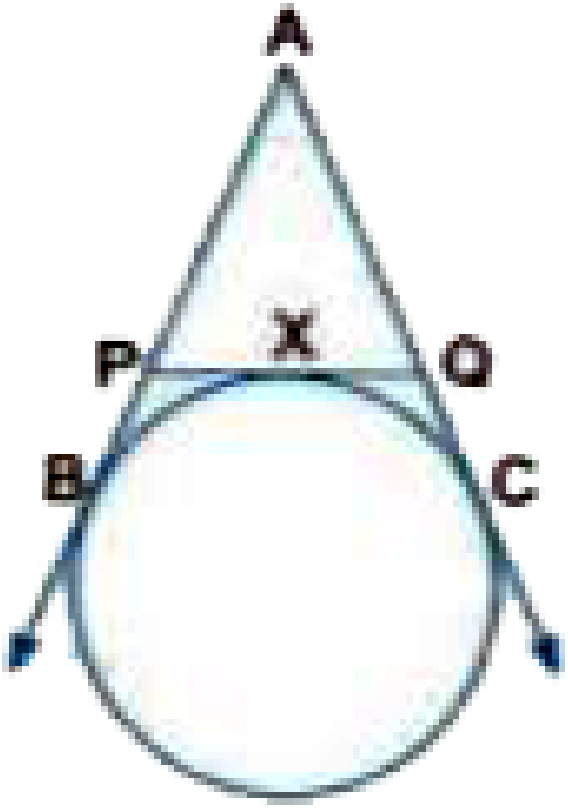
5. If AB,AC,PQ are tangents in Fig. , PX = 2cm and AB = 5cm Find the perimeter of ΔAPQ



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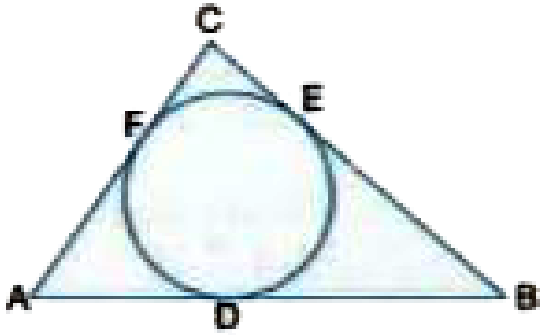
6. A circle in inscribed in a ΔABC having sides 8 cm , 10 cm and 12 cm in Fig Find AD, BE and CF.



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7. 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 .

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8. ABC is Right triangle, right angled at B such that BC = 6 and AB = 8 cm. Find the radius of its incircle.

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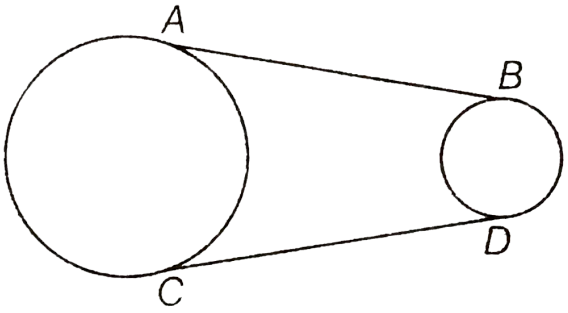
9. In figure, AB and CD are common tangents to two circles of unequal radii. Prove that

AB=CD



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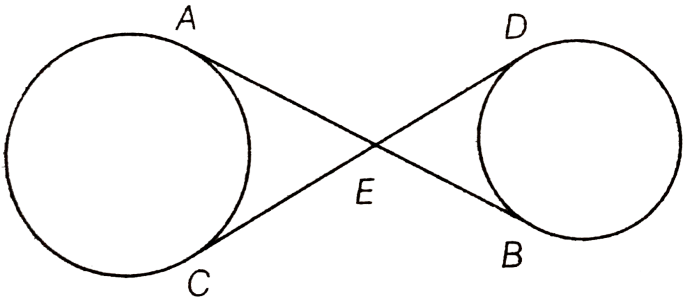
10. In figure, common tangents AB and CD to two circles intersect at E. Prove that AB=CD.



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11. Two tangents PQ and PR are drawn from an external point to a circle with centre 0. Prove that QORP is cyclic quadrileral.

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12. In Fig. 10.54, a circle touches all the four sides of a quadrilateral $ABCD$ with

$AB = 6cm$, $BC = 7cm$ and $CD = 4cm$.

Find AD .(FIGURE)

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13. PQL and PRM are tangents to a circle with centre O at points Q and R respectively. S is a point on the circle such that $\angle SQL = 50^\circ$ and $\angle SRM = 60^\circ$. Find value of $\angle QSR$.

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14. A chord PQ of a circle is parallel to the tangent drawn at a point R of the circle,Prove that R bisects the arc PRQ.

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15. 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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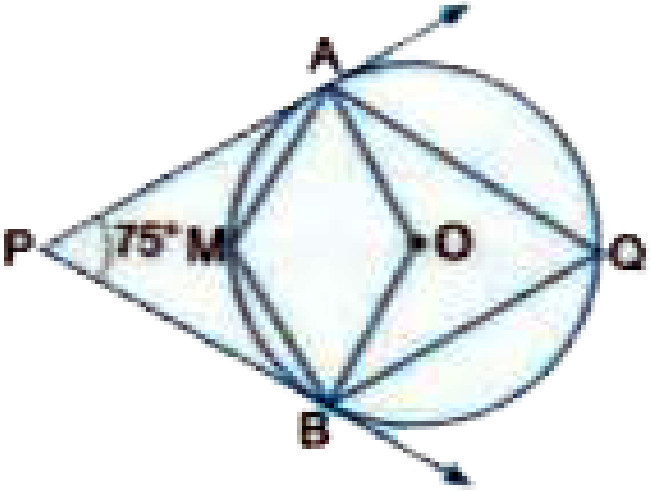
16. If Fig. 'O' is the centre of the circle Determine $\angle AQB$ and $\angle AMB$ if PA and PB are tangents and $\angle APB = 75^\circ$.



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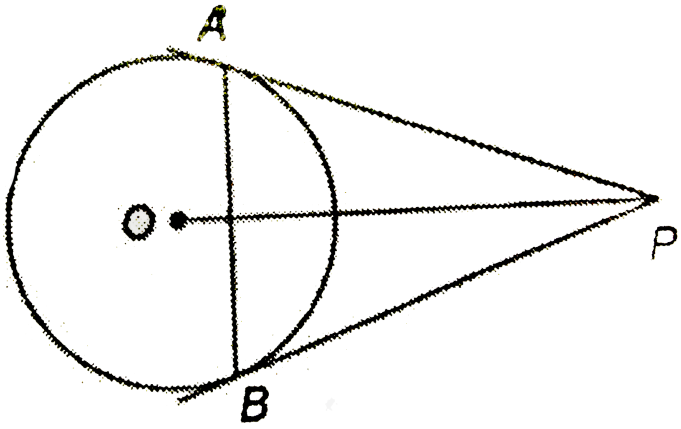
17. From a point P, two tangents PA and PB are drawn to a circle with centre O and radius r. If OP=2r, show that $\triangle APB$ is equilateral.



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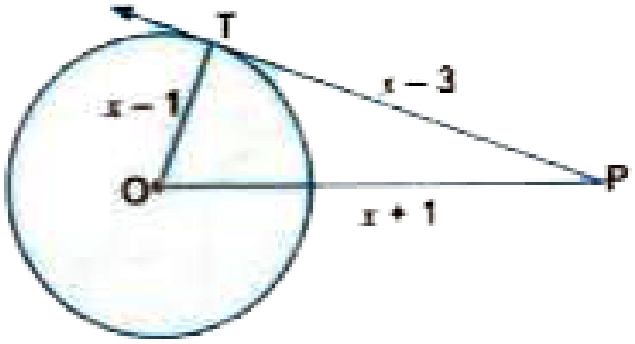
18. Find the actual length of sides of ΔOTP

(Fig)



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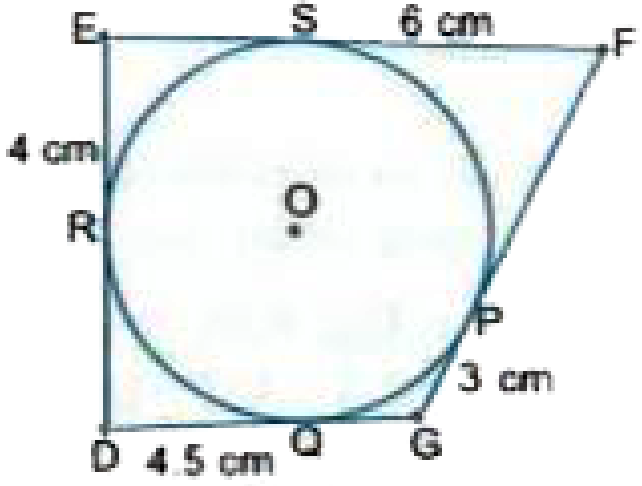
19. Find the perimeter of $\Delta DEFG$. (Fig.) .



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20. If d_1, d_2 (d_2>d_1) be the diameters of two concentric circles and c be the length of a

chord of a circle which is tangent to the other circle prove that $d_2^2 = c^2 + d_1^2$

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21. In Fig. 10.57, a circle is inscribed in a quadrilateral $ABCD$ in which $\angle B = 90o$. If $AD = 23cm$, $AB = 29cm$ and $DS = 5cm$, find the radius r of the circle. (FIGURE)

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22. Let s denotes the semi-perimeter of a ΔABC in which BC=a, CA=b and AB=c. If a circle touches the sides BC, CA, AB, at D, E, F, respectively. Prove that BD=s-b.

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Proficiency Exercise Long Answer Questions 4 Mark

1. In figure, tangents PQ and PR are drawn to a circle such that $\angle RPQ = 30^\circ$. A chord RS is

drawn parallel to the tangent PQ. Find the $\angle RQS$.

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2. Two circles with centres O and O' of radii 3 cm and 4 cm , respectively intersect at two points P and Q such that OP and O'P are tangents to the two circle . Find the length of the common chord PQ.

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3. If a hexagon ABCDEF circumscribe a circle, prove that $AB + CD + EF = BC + DE + FA$

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4. In a right angle triangle ΔABC is which $\angle B = 90^\circ$ a circle is drawn with AB diameter intersecting the hypotenuse AC at P.Prove that the tangent to the circle at PQ bisects BC.

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5. A is a point at a distance 10 cm from the centre O of a circle of radius 6cm . AP and AQ are the tangents to the circle at P and Q .If a tangent BC is drawn at a point R lying on the mirror are PQ to intersect AP at B and AQ at C, find the perimeter of the ΔABC .

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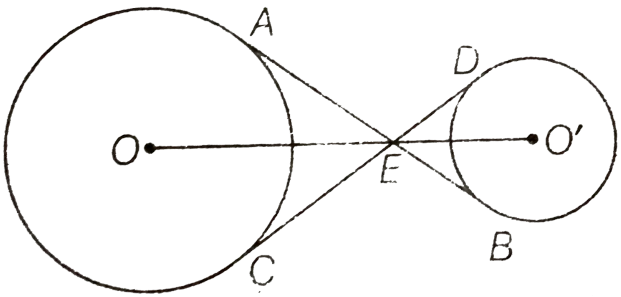
6. In a figure the common tangents, AB and CD to two circles with centers O and O' intersect

at E. Prove that the points O, E and O' are collinear.



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

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8. The tangent at a point C of a circle and a diameter AB when extended intersect at P. If $\angle PCA = 110^\circ$ find$\angle CBA$.

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

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10. If an isosceles triangle ABC , in which AB = AC = 10 cm , is inscribed in a circle of radius 10 cm , find the area of the triangle .

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11. 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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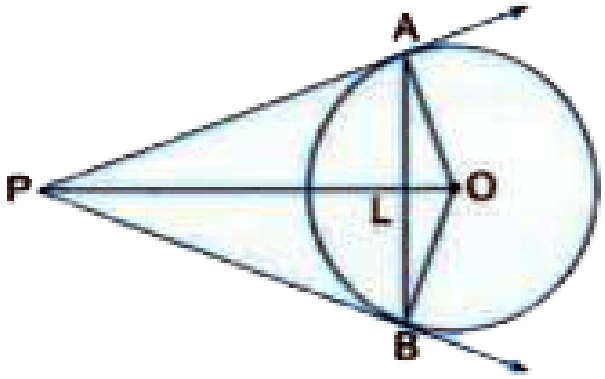
12. In Fig , AB is a chord of a circle , with centre O , such that AB = 16 cm and radius of circle is 10 cm. Tangents at A and B intersect each other at P . Find the length of PA.



A. $10cm$

B. $20cm$

C. $\frac{40}{3}cm$

D. $\frac{20}{3}cm$

Answer: C

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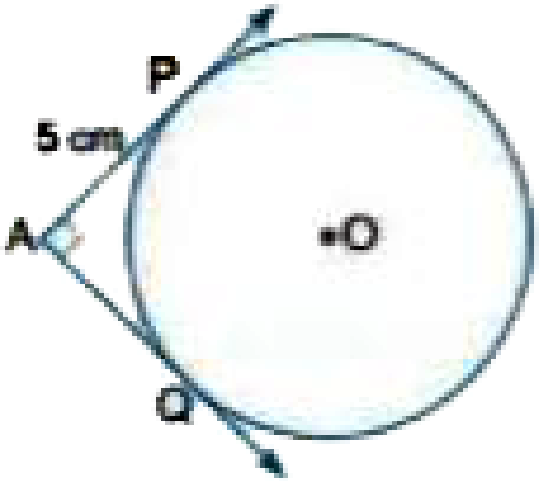
Self Assessment Test

1. In Fig . pair of tangents AP and AQ drawn from an external point A to a circle with centre

O are perpendicular to each other and length of each tangent is 5 cm. Find the radius of the circle.



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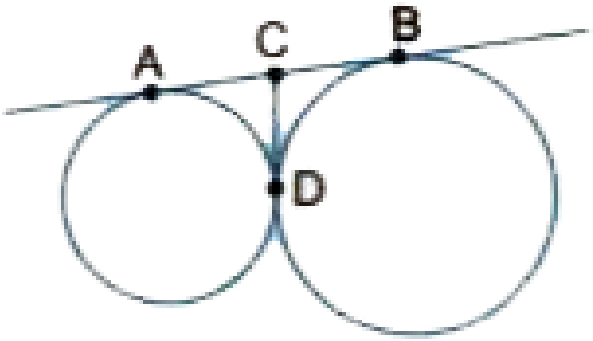
2. AB and CD are common tangents to two circles which intersect each other at C as

shown in the figure IF AB = 6cm , find CD.



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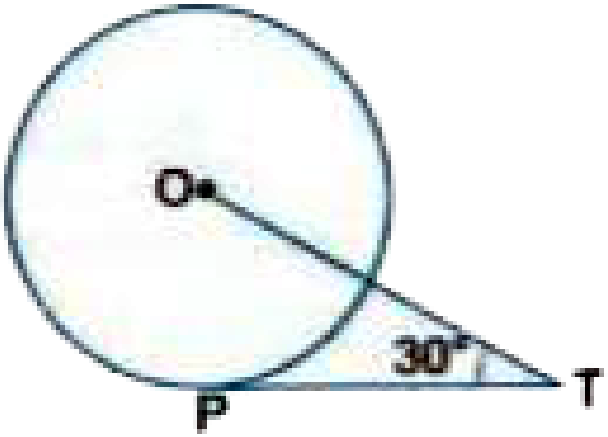
3. In Fig PT is a tangent to the circle (O,r) such that $OT = 6\sqrt{3}$ units and $\angle OTP = 30^\circ$ Find

the length of PT.



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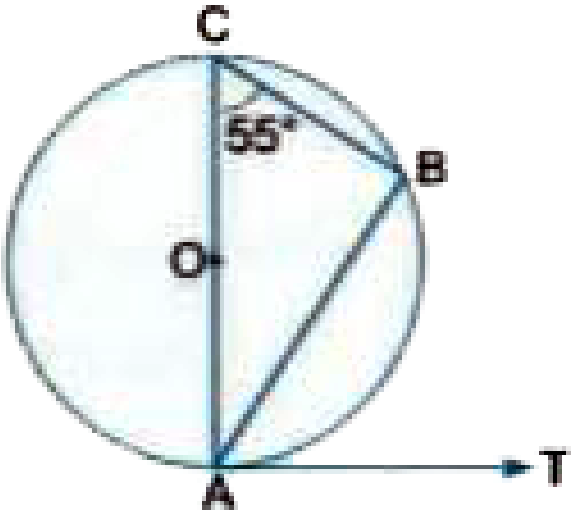
4. In Fig O is the centre of a circle and AT is a tangent at point A . what is the measure of

$\angle BAT$?



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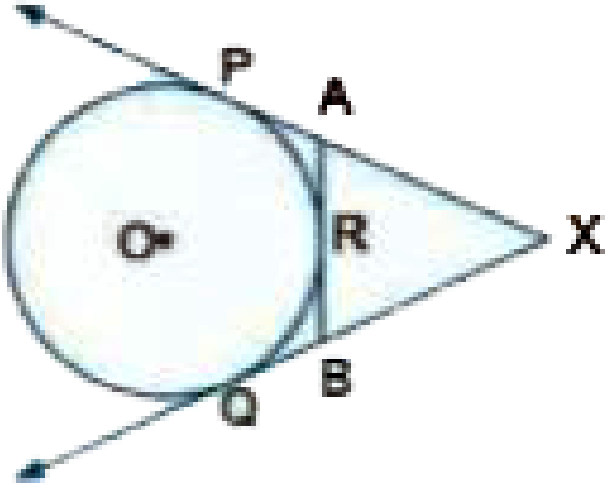
5. In the Fig Prove that XA+AR=XB+BR.



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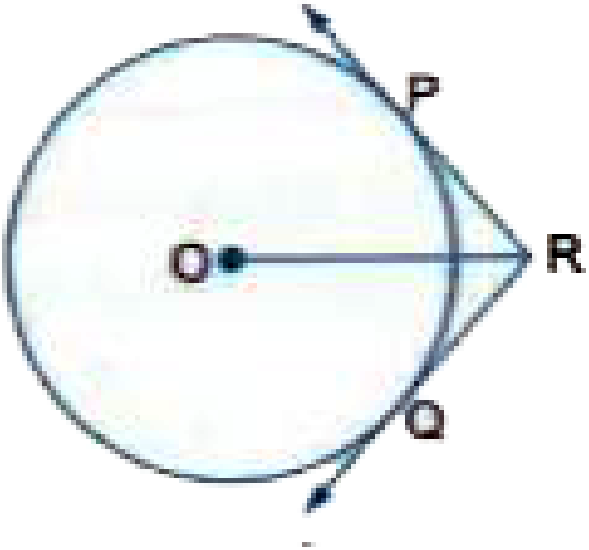
6. In Fig. two tangents RQ and RP are drawn from an external point R to the circle with centre O. If $\angle PRQ = 120^\circ$, then prove that

OR = PR + RQ .



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7. Out of the 2 concentric circle the radius of the outer circle is 5 cm and the chord AC of

the length 8 cm is a tangent to the inner circle find the radius of the inner circle

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8. Two circles touch each other externally. Prove that the lengths of the tangent drawn to the two circles from any point on the common tangent lie at the point of contact of two circles are equal .

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9. P & Q are centres of circles of radii 9 cm and 2cm respectively. PQ = 17 cm. R is the centre of the circle of radius x cm which touches the above externally. Given that angle, PRQ is 90. Write an equation in x and solve it.

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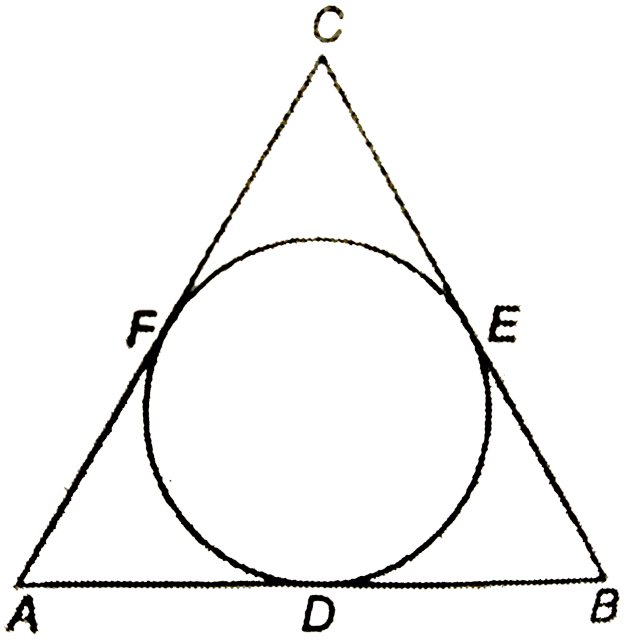
10. A circle is inscribed in a $\triangle ABC$ having sides 8 cm, 10 cm and 12 cm as shown in figure.

Find AD, BE and CF.



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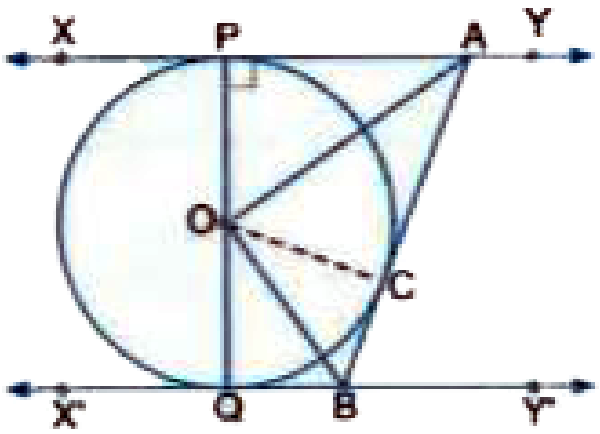
11. In Fig XY and X'Y' are two parallel tangents to a circle with centre O and another tangent

AB with point of contact C intersecting XY and X'Y' at B , prove that $\angle AOB = 90^\circ$



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