MATHS

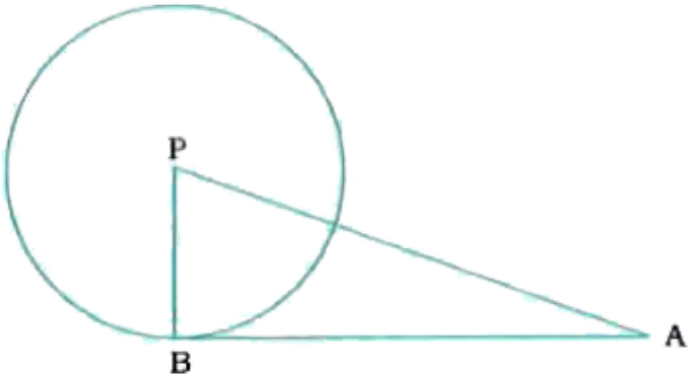
BOOKS - KUMAR PRAKASHAN

CIRCLE

Other Important Examples

1. Point a lies in the exterior of a circle with centre P and radius 7cm. A tangent through. A

touches the circle at B . If AB =24 cm . Find PA.



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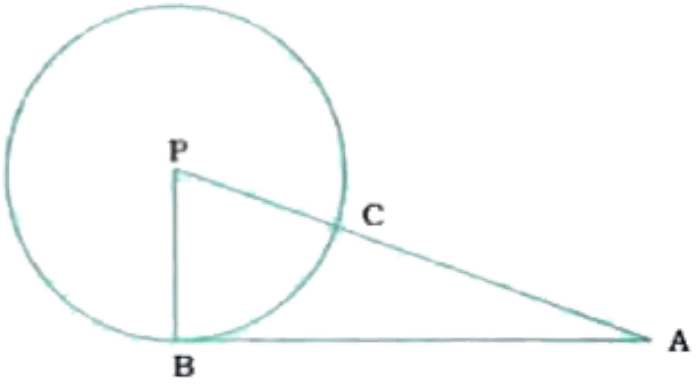
2. AB is a tangent to a cricle with centre P and B is the point of contact. PA intersects the circle at C. If AB=15cm and AC=9cm, find the

radius of the circle.



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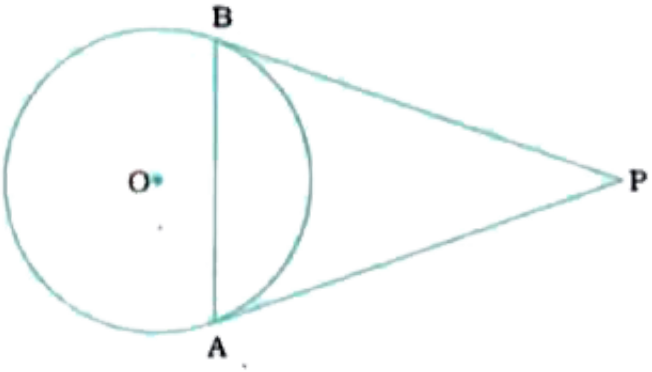
3. Prove that the tangent drawn at the ends of chord of a circle make equal angle with the



chord.

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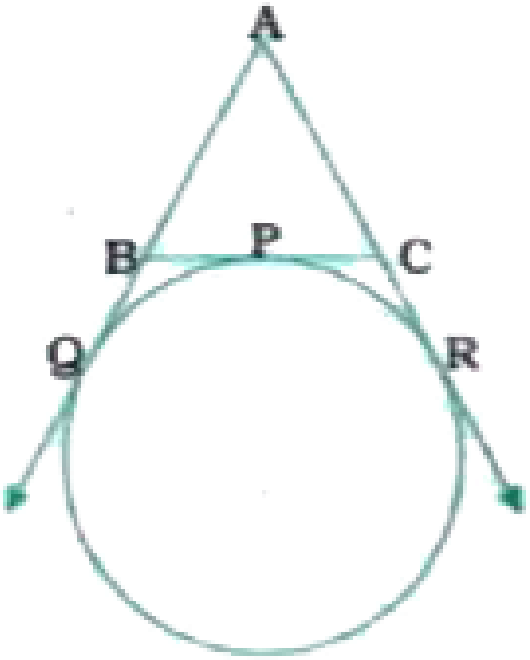
4. A circle is touching the side BC of ΔABC at P and touching AB and AC extended at Q and R respectively. Prove that, $AQ = \frac{1}{2}$ (permeter of

ΔABC).



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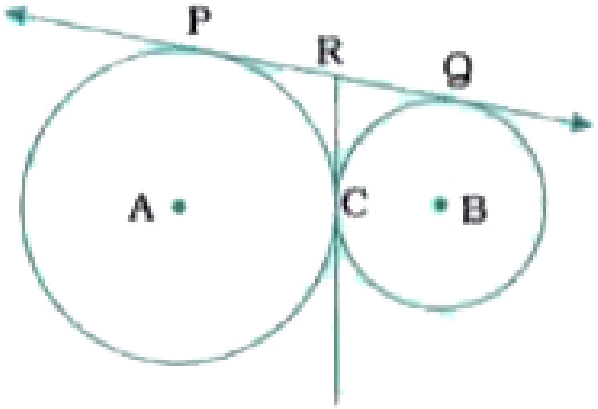
5. In the given figure, two circles with centres A and B touch each other at C bisects the

common tangent at P and Q.



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6. If a, b, c are the side of a right triangle where c is the hypotenuse, prove that the radius of the circle which touches all the side of the triangle is given by $r = \frac{a+b-c}{2}$.

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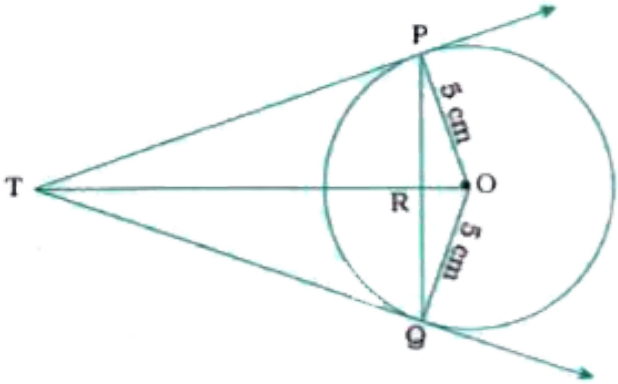
7. PQ is a chord of length 8cm of circle of radius 5cm. The tangent at P and Q intersect at a point T. Find the length TP.



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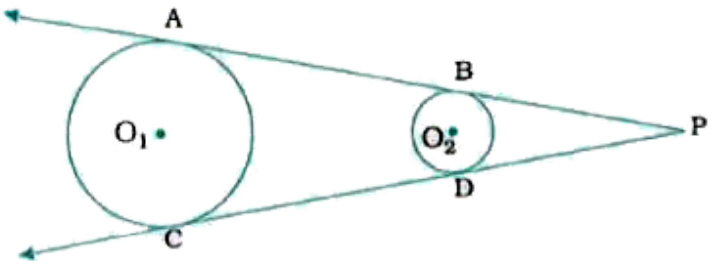
8. As shown in the figure, AB and CD are two common tangents to circles with centres O_1 and O_2 and different radius. Prove that AB=CD



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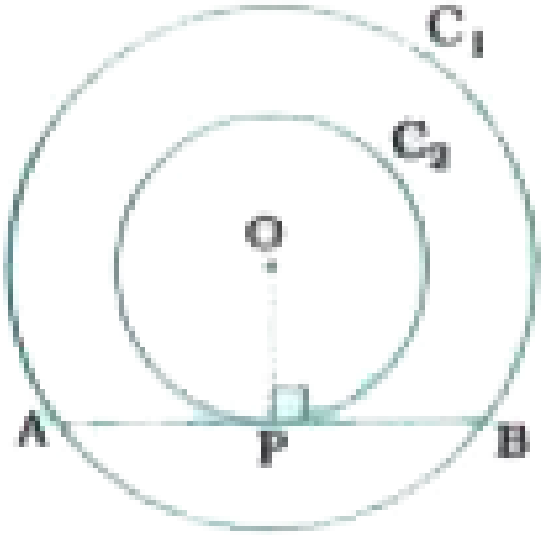
Textual Examples

1. Prove that in concentric circles, the chord of the larger circle, which touches the smaller circle, is busected at the point of contact.



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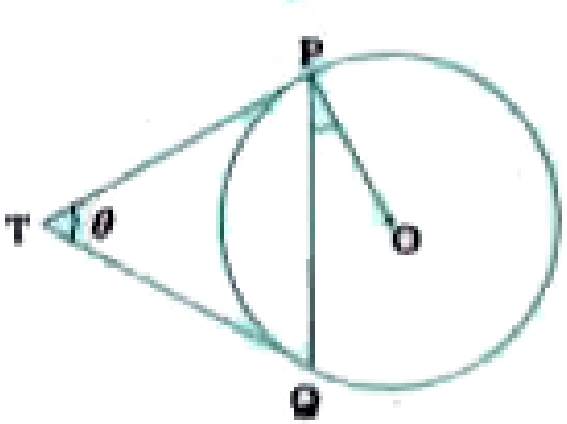
2. Two tangent TP and TQ are drawn to a circle with centre O from an external point T. prove that $\angle PTQ = 2\angle OPQ$.



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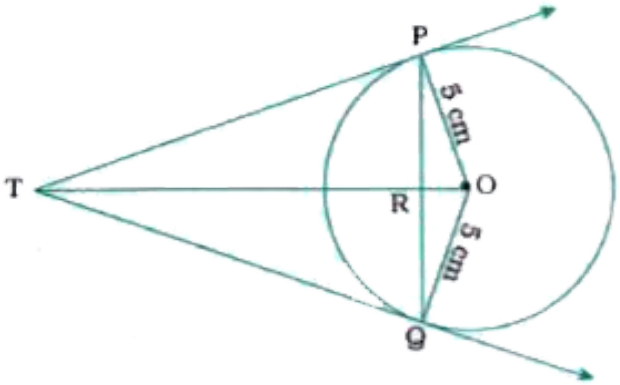
3. PQ is a chord of length 8cm of circle of radius 5cm. The tangent at P and Q intersect at a point T. Find the length TP.



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Test Your Skills

1. Point S lies in the exterior of a circle with centre P and radius 33cm. A tangent from S touches the circle at T and ST=56cm. Find the distance of S from P.

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2. Point M lies in the exterior of a circle with centre A and a tangent from M touches the circle at N. If AM=41cm and MN=40cm, find the radius of the circle.

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3. XY is a tagent to a circle with centre O touching the circle at Y. If OX=61cm and the diameter of the circle is 22cm, find XY.

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4. AB is a tangent to a circle with centre P touching the circle at B. PA intersets the circle at M. If AB=35cm and AM=25cm, find the diamter of the circle.

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5. PM is a tangent to a circle with centre O touching the circle at M. If OP=85cm and PM=77cm, find the radius of the circle.

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6. Out of two cocentric circles, the radius of the outer cirle is 25cm and the chord AC of length 48cm is a tangent to the inner circle. Find the radius of the inner circle.

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7. Prove that a diameter AB of a circle bisects all those chords which are parallel to the tangent at the point A.

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

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

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10. In $\triangle ABC$ AB=20cm, BC=21cm and AC=29cm. Find the radius of the circle touching all the sides of $\triangle ABC$.

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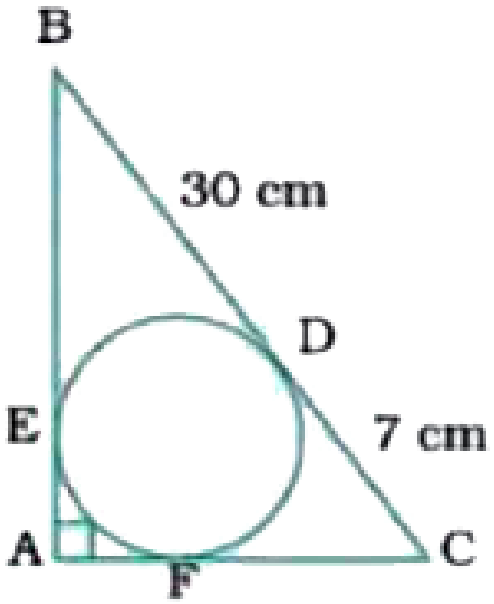
11. In the given figure, BC,BA and AC are tangents to the circle touching the circle at D,E and F respectively. If BD=30cm, CD=7cm and $\angle A = 90^\circ$, find the radius of the circle.



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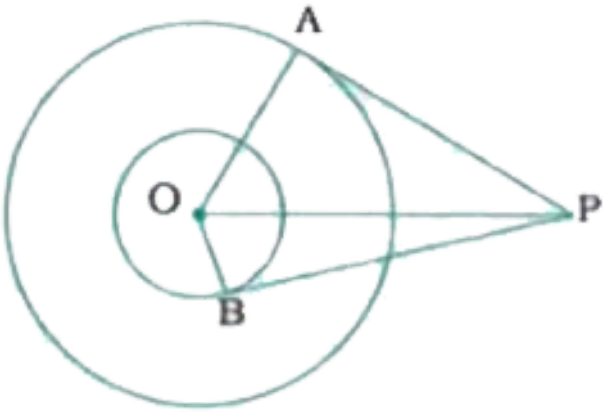
12. In the given figure, two concentric circles with centre O and radii 5cm and 3 cm are given, PA and PB are tangents to those circle at A and B respectively. If PA =12cm, find PB.



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Practice Thoroughly

1. A 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 10cm. Find the radius of the circle.

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2. AB is a diameter and AC is a chord of a circle with centre O such that $\angle BAC = 30^\circ$. The

tangent at C intersects AB at a point D. Prove that BC=BD.

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3. Prove that the tangent drawn at the midpoint of an arc of a circle is parallel to the chord joining the end points of the arc.

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4. If $d_1, d_2(d_2 > d_1)$ be the diameter of the two cocentric 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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5. From an external point P, tangent PA=PB are drawn to a circle with centre O. If $\angle PAB = 50^\circ$, then find $\angle AOB$.

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6. Two cocentric circles are of diameters 30cm and 18cm. Find the length of the chord of the larger which touches the smaller circle.

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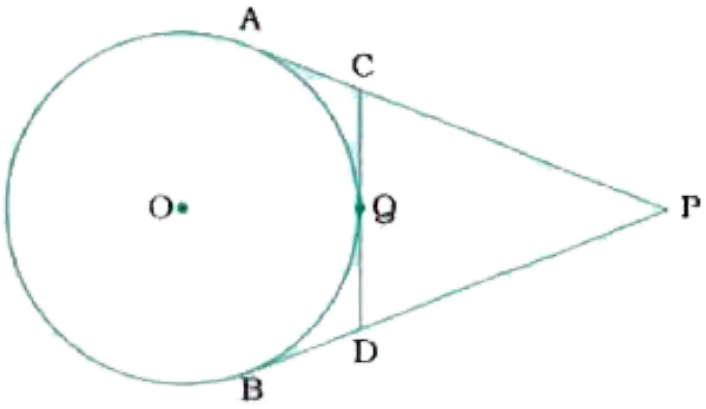
7. In the given figure, PA and PB are tangent to the circle from an external point P. CD is another tangent touching the circle at Q. If

PA=12cm and QC=QD=3cm, then find PC+PD.



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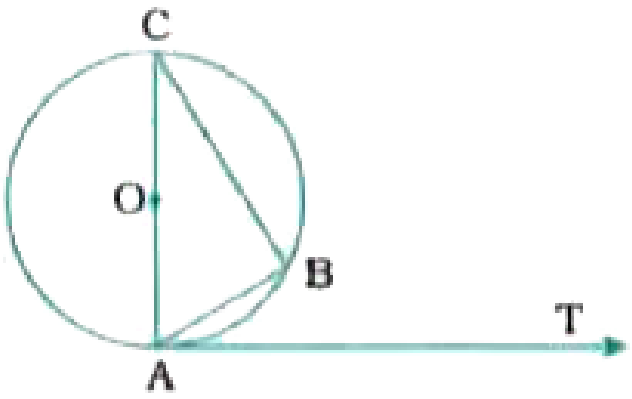
8. AB is a chord of a circle with centre O, AC is a diameter and AT is the tangent at A as shown

in the figure. Prove that $\angle BAT = \angle ACB$.



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Exercise 10 1

1. How many tangent can a circle have ?

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2. A tangent to a circle intersects it ___ points.

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3. A line intersecting a circle in two points is called a secant.

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4. A circle can have two parallel tangents. parallel to a secant at the most.

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5. The common point of a tangent to a circle and the circle is called the point of contact.

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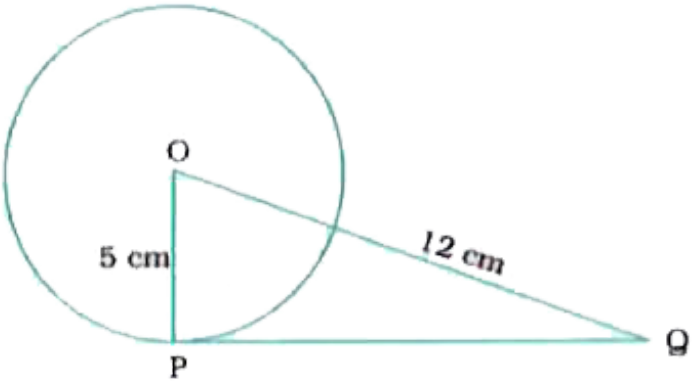
6. A tangent PQ point P of a circle of radius 5cm meets a line through the centre O at a point Q so that OQ=12 cm. length PQ is :



A. 12cm

B. 13cm

C. 8.5cm

D. $\sqrt{119}cm$

Answer: D

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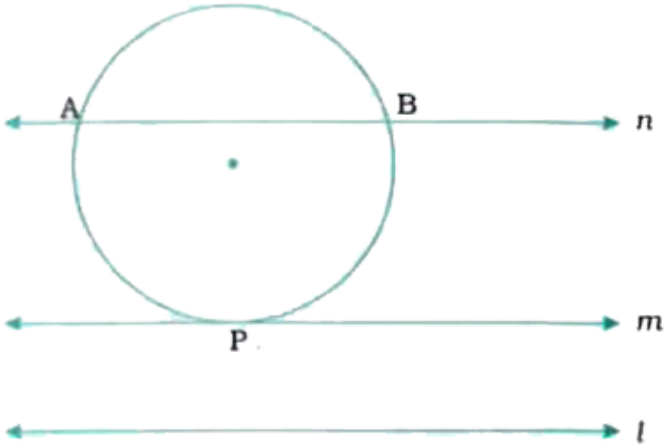
7. Draw a circle and two lines parallel to a given line such that one is tangent and the other, a secant to the circle.



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Exercise 10 2

1. From a point Q. the lent of tangent to a circle is 24cm and the distance of Q from the centre is 25cm. The radius of the circle is.....

A. 7m

B. 12cm

C. 15cm

D. 24.5 cm

Answer: A

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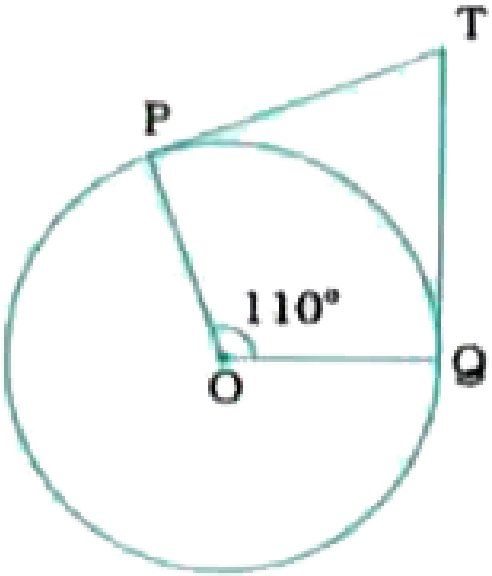
2. In the given figure. If TP and TQ are the two tangents to a circle with centre O so that $\angle$

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



A. 60°

B. 70°

C. 80°

D. 90°

Answer: B

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3. If tangent PA and PB from point P to a circle with centre O are inclided to each other at an angle of 80°. Then $\angle POA = \ldots\ldots\ldots$

A. 50°

B. 60°

C. 70°

D. 80°

Answer: A

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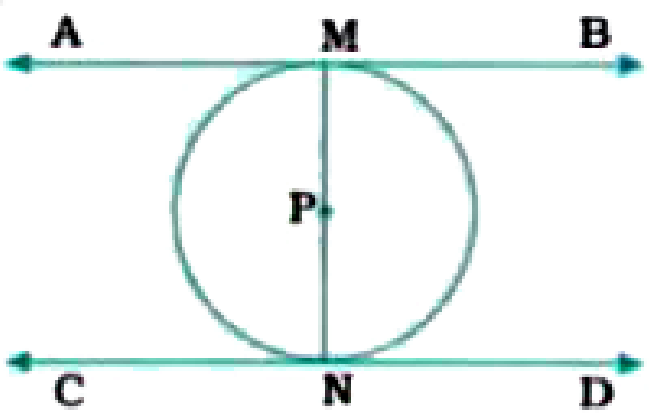
4. Prove that tangent drawn at the ends of a diameter of a circle are parallel.



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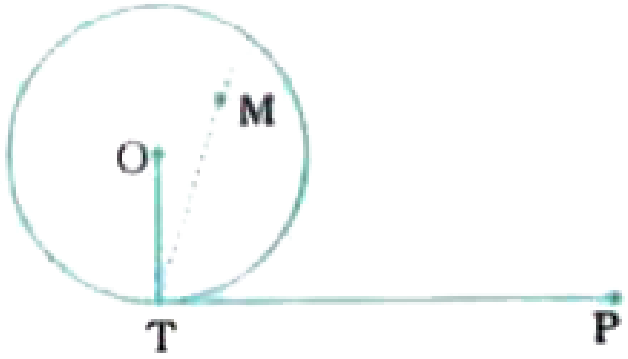
5. Prove that perpendicular at the point of contact to the tangent to circle passes through the centre.



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

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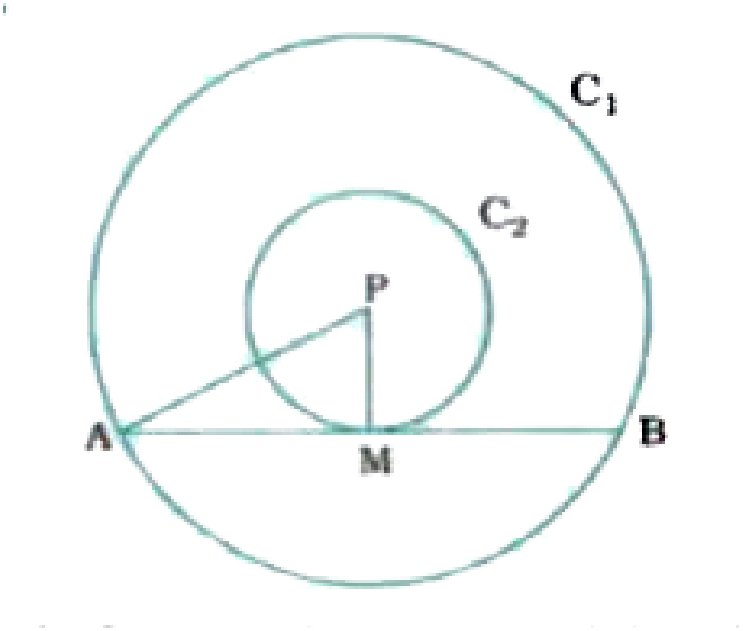
7. Two concentric circle are of radii 5cm and 3cm. Find the length of the chord of the larger

circle which touches the smaller circle.



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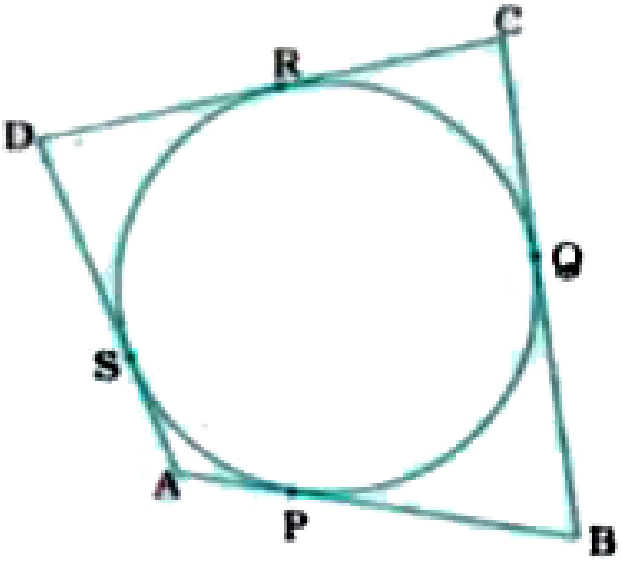
8. A quadrilateral ABCD is drawn to circumscribe a circle (see the given figure).

Prove that AB+CD = AD+BC.



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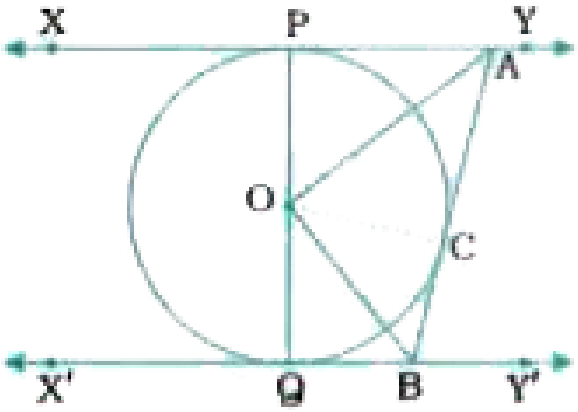
9. In the given figure. XY and X$Y^{'}$ are two parallel tangent to a circle with centre O and another tangent AB with point of contact C is

intersecting XY at A and XY at B. Prove that $\angle AOB = 90^\circ$



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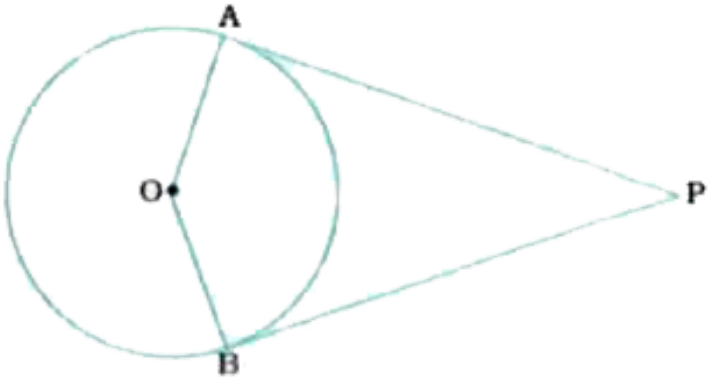
10. Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle

subtended by the line -segment joinig the point of contact at the centre.



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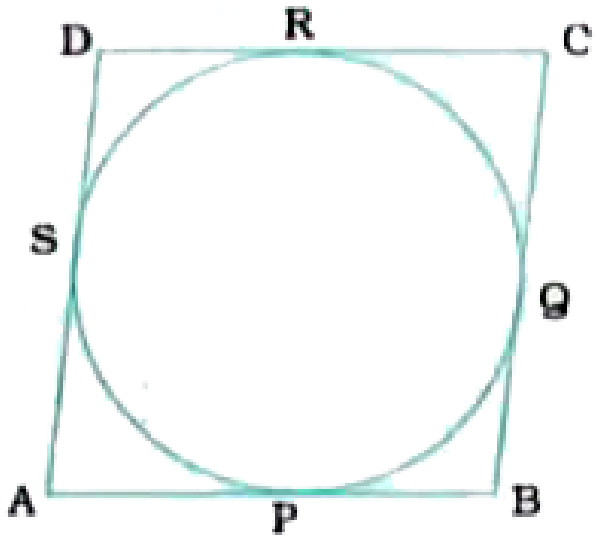
11. Prove that the parallelogram circumscribing a circle is a rhombus.



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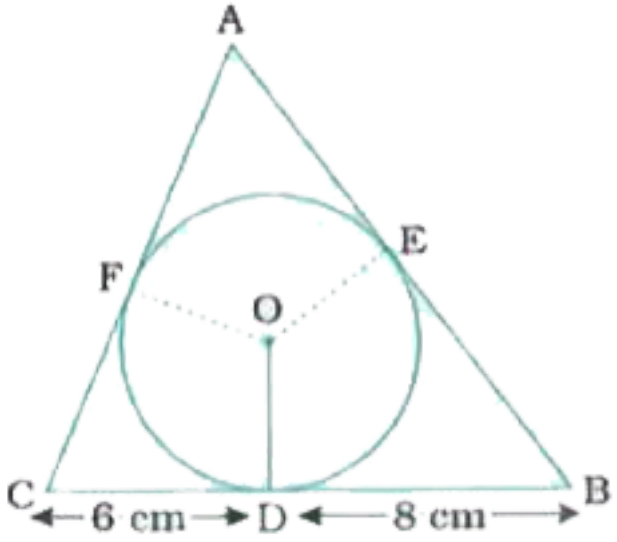
12. A triangle ABC is drawn to circumsribe a circle of radius 4cm such that the segment BD and DC into which BC is divided by the point of contact D are of lengths 8cm and 6cm

respectively.Find the sides AB and AC.



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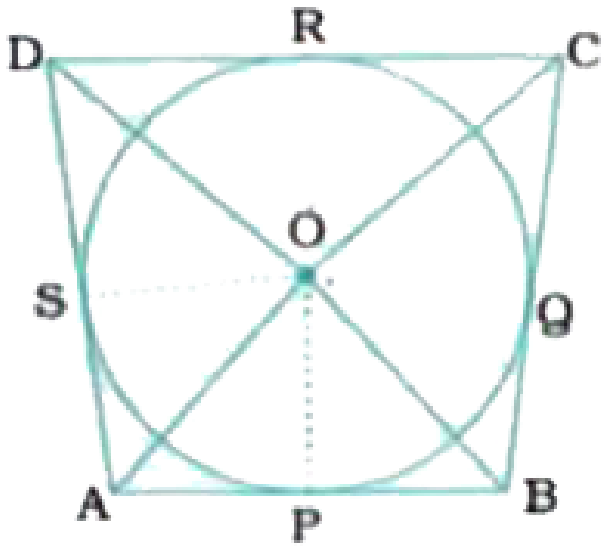
13. Prove that opposite side of a quadrilateral circumscribing a circle subtend supple.

Mentary angle at the center of the circle.



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Objective Questions Fill In The Blanks

1. From a point Q. the lent of tangent to a circle is 24cm and the distance of Q from the centre is 25cm. The radius of the circle is.....

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2. If tangent PA and PB from point P to a circle with centre O are inclided to each other at an angle of 80°. Then $\angle POA = \ldots\ldots\ldots$

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3. PQ is a tangent to a circle with centre O at the point P. If ΔOPQ is an isosceles triangle, then $\angle OQP = \ldots\ldots\ldots\ldots$

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4. Two equal circle touch each other externally at C and AB is a common tangent to the circle. Then. $\angle ACB = \ldots\ldots\ldots$

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5. The four sides of quadrilateral ABCD are tangential to a circle. If AB = 7.2 cm CD =.....cm

.

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Objective Questions

1. PQ is tangent drawn from point P to a circle with centre O and QR is a diameter of the circle, such that $\angle POR = 120^\circ$. Then, $\angle OPQ = \ldots\ldots\ldots$

A. 60°

B. 45°

C. 30°

D. 90°

Answer: C

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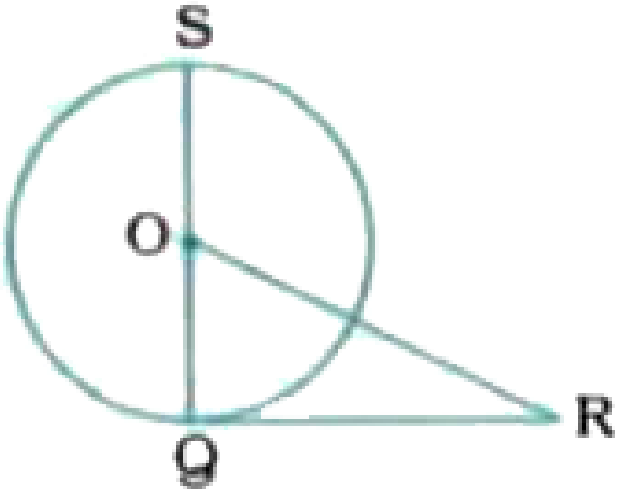
2. In the given figure, Rq is a tangent to the circle with centre O. if SQ = 6cm and QR = 4cm.

Then. OR = ...cm.



A. 8

B. 3

C. 2.5

D. 5

Answer: D

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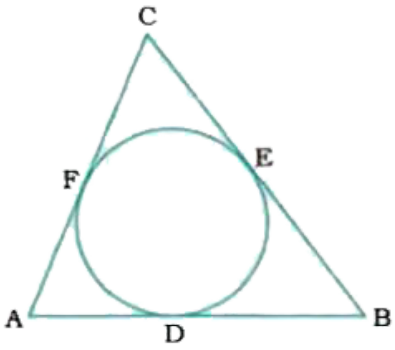
3. In the given figure, if $AB = 12cm.\ BC = 8cm$ and $AC = 10cm$, then $AD = \ldots\ldots\ldots cm$



A. 5

B. 4

C. 6

D. 7

Answer: D

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4. AP and AQ are tangent drawn from a ponit A to a circle with centre O and radius 9cm. If OA = 15 cm. then AP + AQ = ... Cm.

A. 12

B. 18

C. 24

D. 36

Answer: C

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5. At one end A of a diameter AB of a circle of rdius 5 cm, tangent XAY is drawn to the circle. The length of the chord CD parallel to XY and at a distance 8 cm from A is ..... cm .

A. 4

B. 5

C. 6

D. 8

Answer: D

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

A. $\frac{3\sqrt{3}}{2}$

B. 6

C. 3

D. $3\sqrt{3}$

Answer: D

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7. In a right triangle ABC, right arigled at B ; BC = 12 cm and AB = 5 cm. Then the radius of the circle inscribed in the triangle is.....cm.

A. (A) 4

B. (B) 3

C. (C) 2

D. (D) 1

Answer: C

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8. If the angle between two radii of a circle is 130°, the angle between the tangents at the ends of the radii is.....

A. 90°

B. 50°

C. 70°

D. 40°

Answer: B

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9. If radii of the two concentric circles are 15cm and 17cm, then the length of each chord of one circle which is tangent to other is:

A. 8

B. 16

C. 30

D. 17

Answer: D

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10. The pair of tangents AP and AQ drawn from an external point to a circle with centre O are perpendicular to each other and the length of

each tangent is 4 cm. Then, the radius of the circle is ... cm.

A. 10

B. 7.5

C. 5

D. 2.5

Answer: D

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Objective Questions Answer The Following By A Number Or A Word Or A Sentence

1. If the radii of two circles with centres o and O' are 7 cm and 10 cm and the distance between their centres is 12 cm. In how many point do the circle intersect?

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2. What is the radius of a circle inscribed in a triangle with sides of length 12cm, 35cm and

37cm?

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3. Two tangents TA and TB to circle with centre O are inclined to each other angle of 70°. Then, Find $\angle OAB$.

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4. A circle is inscribed in a quadrilateral PQRS. If PQ= 5cm QR=8.2cm and RS = 9.3 cm, what is

the length of SP?

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5. The radii of two concentric circles are 40 cm and 41 cm What is the length of a chord of the bigger circle which is tangent to the smaller circle?

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Objective Questions True False

1. The radii of two circles with centres O and O' are 9 cm and 7 cm and the distance between their centres is 20 cm Then those circles will have _____ common tangents.

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2. A rectange circumscribing a circle is a square.

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3. A quadrilateral ABCD circumscribes a circle. In ABCD. If AB is the longest side, then CD is the shortest side.

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4. Diameter of circle is 20 cm. Then, the length of each tangent to that are less than 20 cm. True or false

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