doubtnut
India's Number 1 Education App

MATHS

BOOKS - NAVBODH MATHS (HINGLISH)

CIRCLE

4.1 (1 mark each)

1. . . .. circle (s) can pass through a given point.

A. One

B. Two

C. Three

D. Infinite.

Answer: D

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2. Two circles of radii 5.5 cm and 3.3cm respectively touch each other. What is the distance between their centre ?

A. 4.4 cm

B. 8.8 cm

C. 2.2 cm

D. 8.8 or 2.2 cm

Answer: D

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3. What is the measure of a semicircle ?

A. 90°

B. 180°

C. 360°

D. 270°

Answer: B

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4. If the measure of an arc of a circle is 60° , then what is the measure of its corresponding arc ?

A. 60°

B. 120°

C. 30°

D. 300°

Answer: D

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5. Length of a tangent segment drawn from a point which is at a distnace 12.5 cm from the centre of a circle

is 12cm , find the diameter of the circle.

A. 25 cm

B. 24 cm

C. 7 cm

D. 14 cm

Answer: C

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6. If two circles touch externally , how many common tangents can be drawn to them ?

A. One

B. Two

C. Three

D. Four

Answer: C

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7. $\angle ACB$ is inscribed in arc ACB of a circle with centre O . If $\angle ACB = 65^\circ$, find m (arc ACB) .

A. 65°

B. 130°

C. 295°

D. 230°

Answer: D

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8. Chords AB and CD of a circle interset inside the circle at point E. If AE = 5.6 , EB = 10 cm , CE = 8 ,find ED.

A. 7

B. 8

C. 11.2

D. 9

Answer: A

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9. In a cyclic $\square$ ABCD, twice the measure of $\angle A$ is thrice the measure of $\angle C$. Find the measure of $\angle C$.

A. 36°

B. 72°

C. 90°

D. 108°

Answer: B

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10. Points A,B,C are on a circle, such that m(arc AB) = m (arc BC) $= 120^\circ$. No point, except point B, is common to the arcs. What type is the ΔABC?

A. Equilateral triangle

B. Scalene triangle

C. Right angled triangle

D. Isosceles triangle

Answer: A

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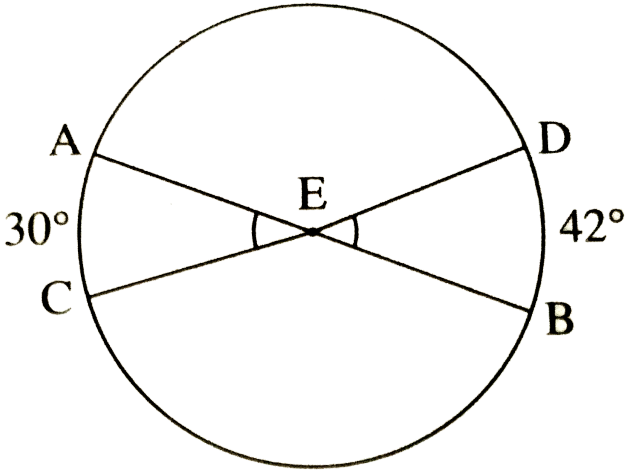
11. From the information given in the figure, find the measure of $\angle AED$.



A. 42°

B. 30°

C. 36°

D. 72°

Answer: C

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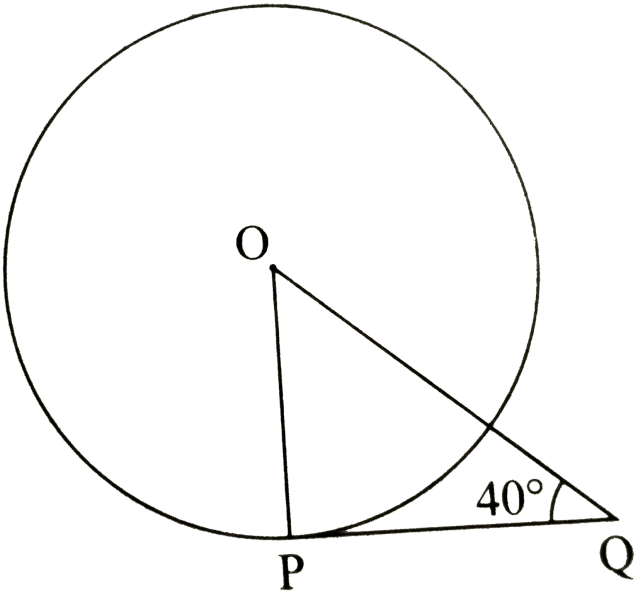
4.2 (1 mark each)

1. In the figure, seg PQ is tangent OP is the radius, $\angle OQP = 40^\circ$, then the measure of $\angle OPQ$ is ..... and the measure of $\angle POQ$ is

. . ..



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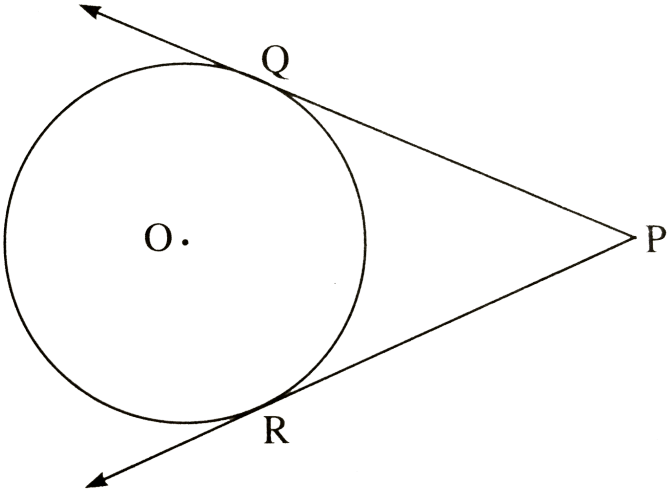
2. In the figure , PQ and PR are tangents drawn from and external point P to the circle with centre O. Q and R are the points of contact. If PQ = 5 cm then what is the

length of segment PR ? Why ?



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3. Two circles with radii 3 cm and 2.5 cm touch each other externally then find the distance between their centre.

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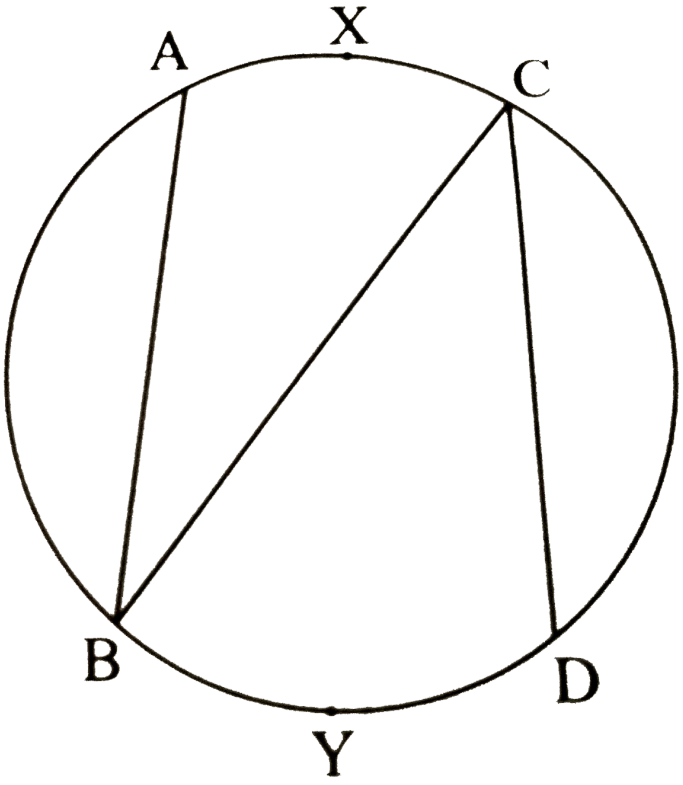
4. In the figures, $\angle ABC$ is inscribed in arc ABC and intercepts arc AXC and $\angle BCD$ is inscribed in arc BCD and intercepts arc BYD. If $\angle ABC = 30^\circ$ and m (arc BYD) $= 80^\circ$ then the m (arc AXC) = ... and measure of $\angle BCD =$ .....



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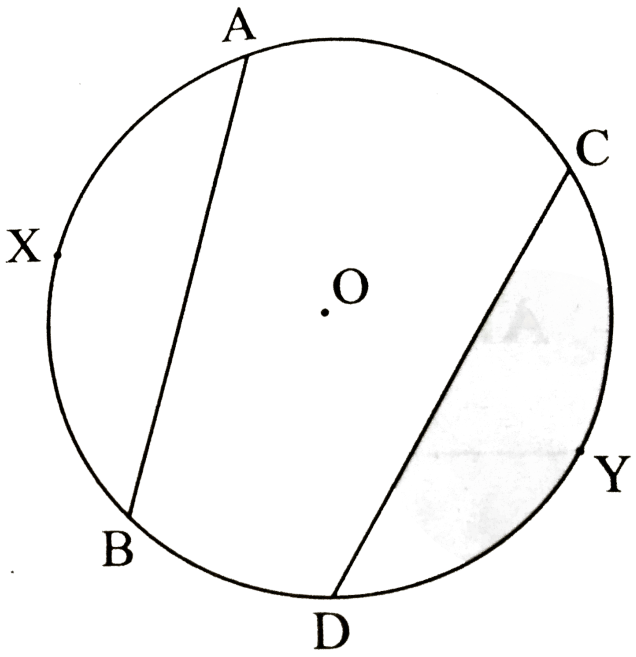
5. Chords AB andCD of a circle with centre O are congruent. If m(arc AXB) $= 120^\circ$ then what is the m(arc(CYD).



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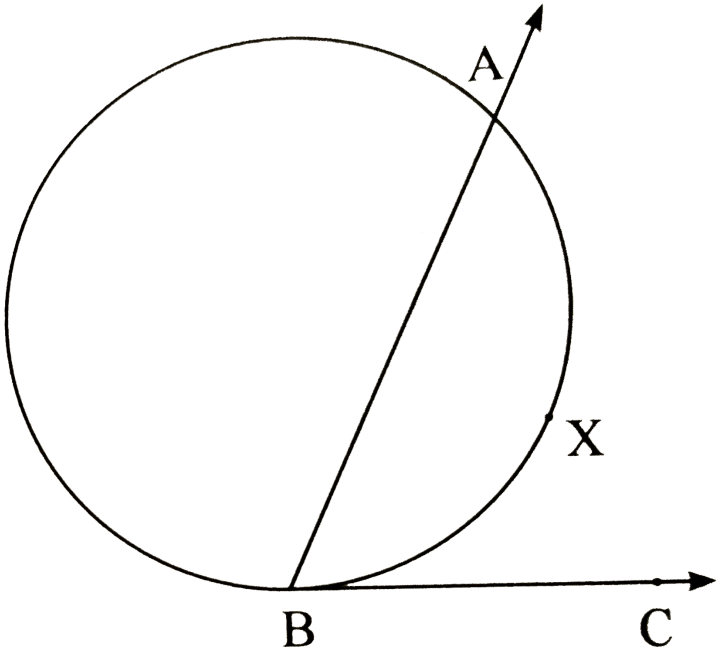
6. In the figure, ray BC is tangent at point B and ray BA is secant. $\angle ABC$ intercepts are AXB if m(arc AXB) $= 130^\circ$ then find the measure of $\angle ABC$.



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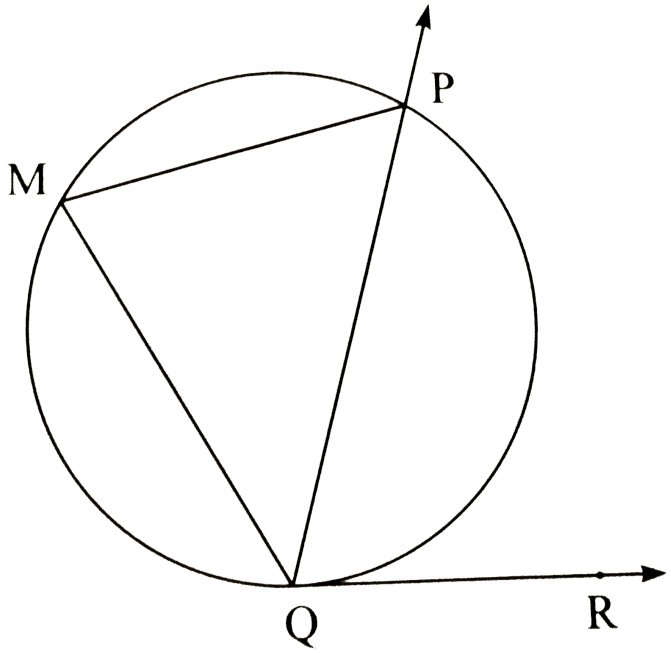
7. In the figre, ray QR is tangent and ray QP is secant. $\angle PMQ$ is inscrbed in arc PMQ . $\angle PQR$and $\angle PMQ$ initerceptsarc PQ.If $\angle PQR = 75^\circ$ then what is the measure of $\angle PMQ$? Why ?



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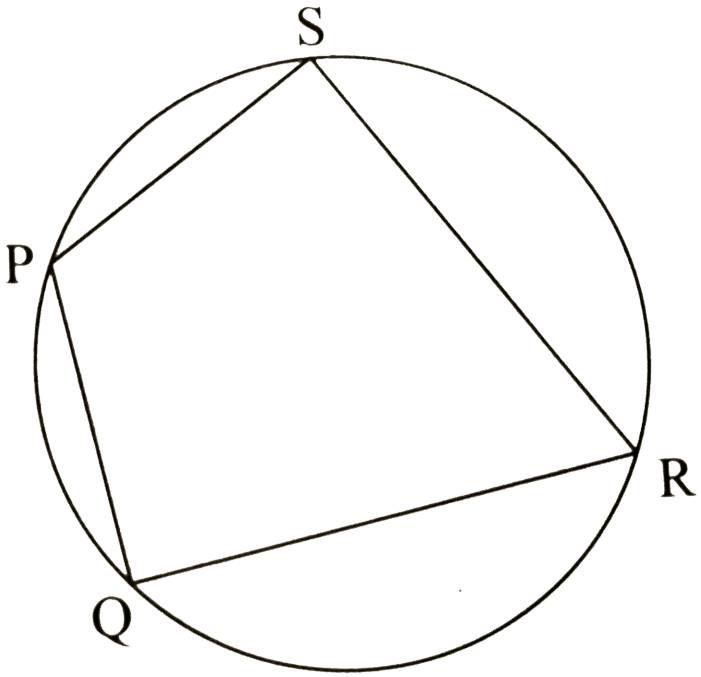
8. □ PQRS is cyclic . If $\angle QPS = 115^\circ$ then what is the measure of $\angle QRS$? Why ?



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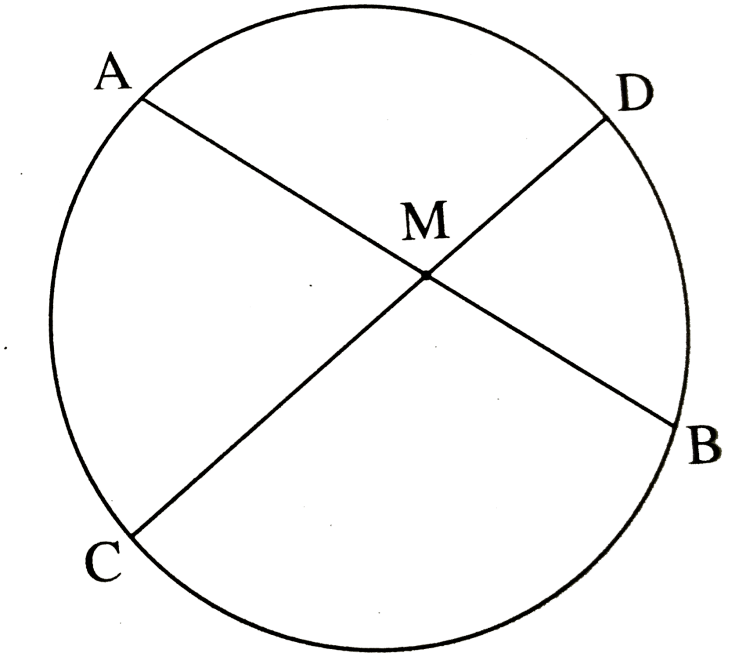
9. Chords AB and CD intersect at point M inside the circle then theorem of internal division of chords.

$AM \times BM = \square \times \square$



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4.3 (1 mark each)

1. If two circles have radii 10 cm and 15cm and they touch each other. Find the distance between their centres.

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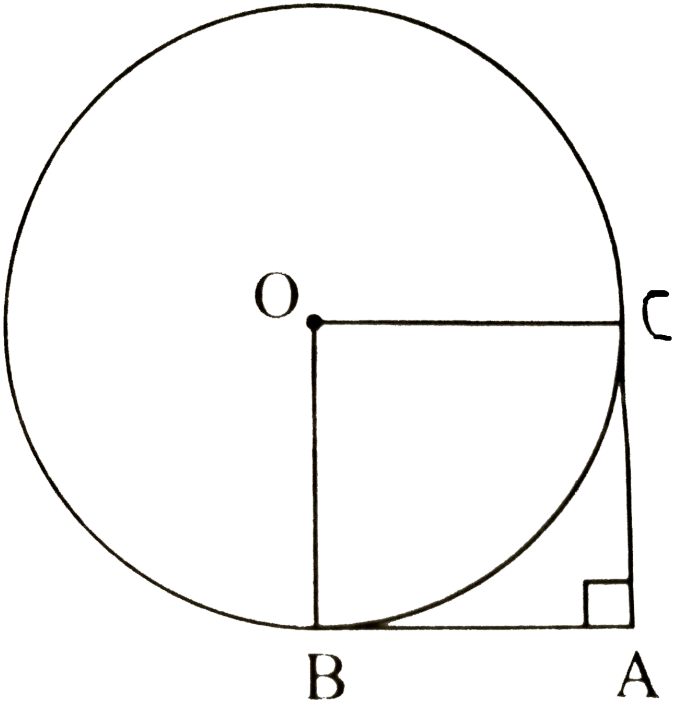
2. In the figure,tangents at B and C of the circle with centre O intersect at point A. If $\angle BAC = 90^\circ$ then

prove □BACO is a square



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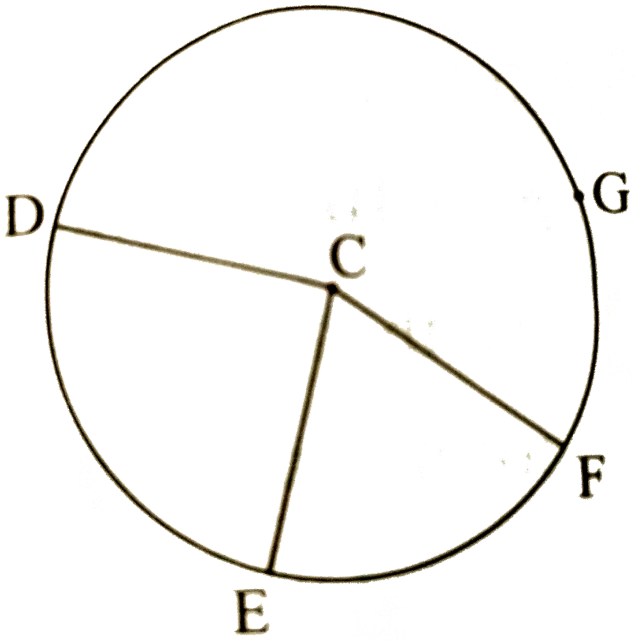
3. In the figure , points G,D,E,F are concyclic points of a cicle with centreC.

$\angle ECF = 70^\circ$

m (arc DGF) $= 200^\circ$,

find m(arc DE) and m(arc DEF) .



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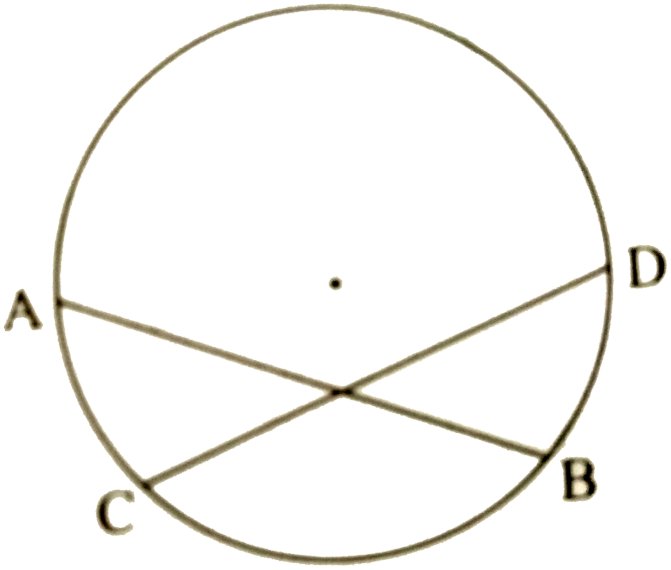
4. In the figure, chord AB $\cong$ chord CD

Prove that ,

ar AC $\cong$ arc BD



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5. Prove that, angles inscribed in the same arc are congruent

$\angle PQR$ and $\angle PSR$ are inscribed in the same arc.

Arc PXR is intercepted by the angles.

To prove : $\angle PQR \cong \angle PSR$

Proof :

$m\angle PQR = \frac{1}{2} m(arcPXR)$ ..... $\square$

$m\angle \square = \frac{1}{2} m(arcPXR)$ ....(2) $\square$

$\therefore m\angle \square = m\angle PSR$ .....[From (1) and (2)]

$\therefore \angle PQR \cong \angle PSR$ ...(Angles equal in measure are congrument)

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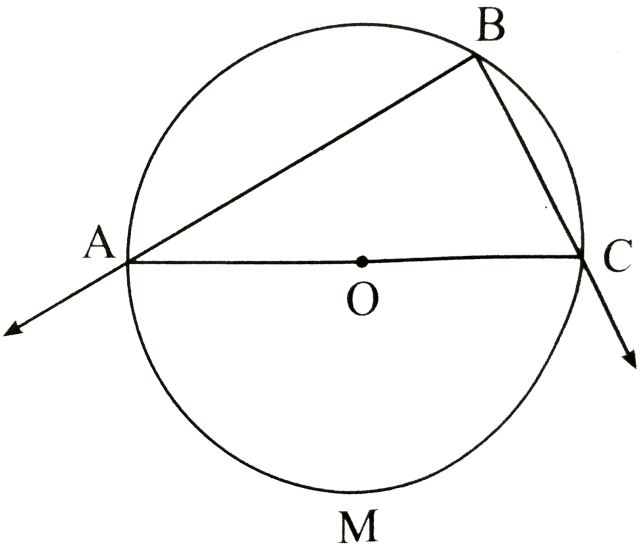
6. Observe the following figure and complete the following activity :

$\angle ABC$ is 90°



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7. In order to prove 'Opposite angles of a cyclic quadrilateral are supplementary .'

(1) Draw a neat labelled figure.

(2) Write 'Given ' and 'To prove' from the figure drawn by you.

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8. Chord AB and CD intersect each other at point E in the initerior of the circle. In order to prove $\angle CEB = \frac{1}{2}[m(arcAD) + m(arcCB)]$

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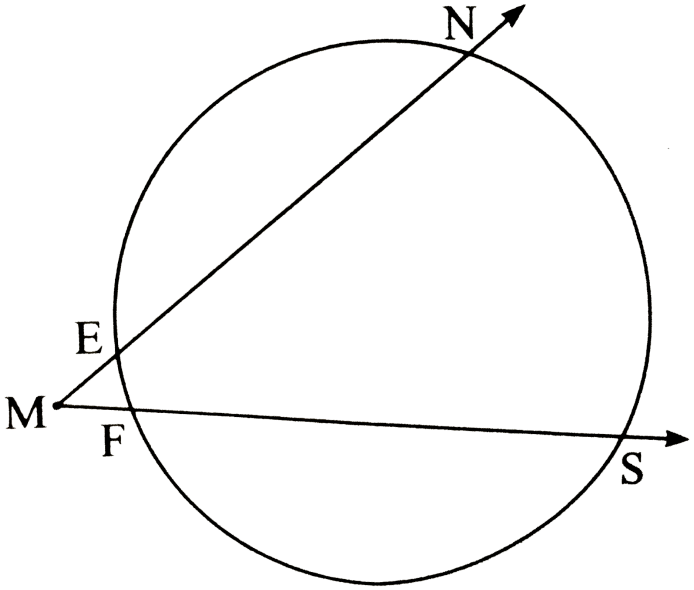
9. In the figure,

m) arc NS) $= 125^\circ$

m (arc EF) = 37°

find the measure $\angle NMS$,



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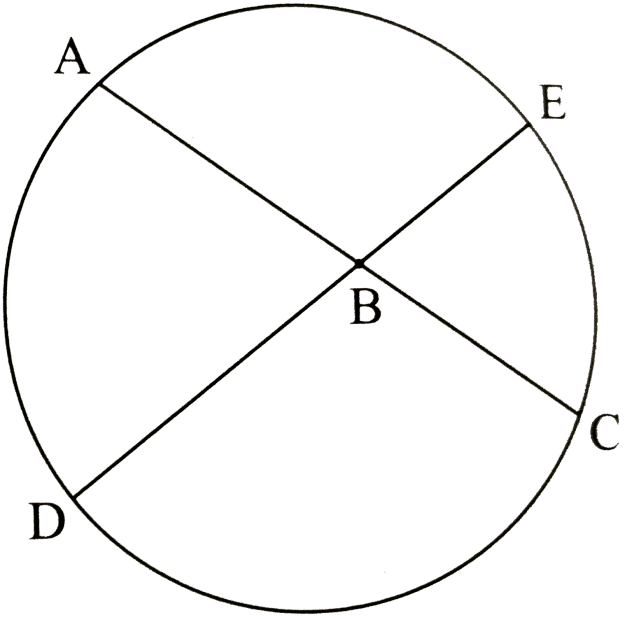
10. In the figure, chords AC and DE intersect at B. If $\angle ABE = 108^\circ$, m (arc AE) $= 95^\circ$, find m (arc DC).



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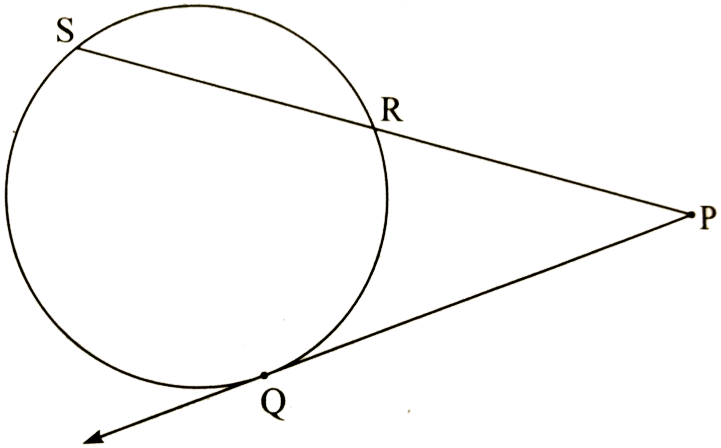
11. In the figure, ray PQ touches the circle at point Q. If PQ =12, PR = 8, then find PS.



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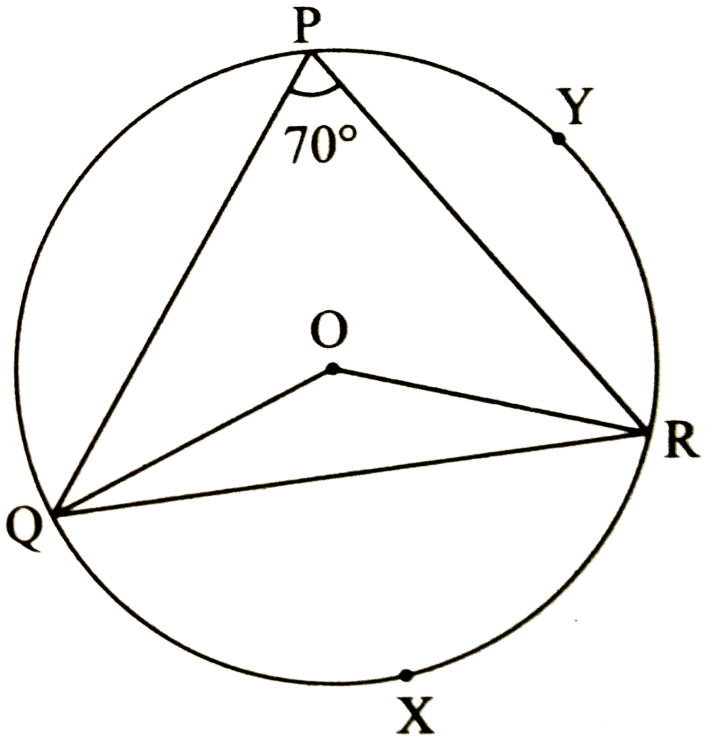
4.4 (1 mark each)

1. In the figure, O is the centre of circle $\angle QPR = 70^\circ$ and m (arc PYR) $= 160^\circ$, then find the value of each of the following :

(a) m (arc QXR)

(b) $\angle QOR$

(c) $\angle PQR$



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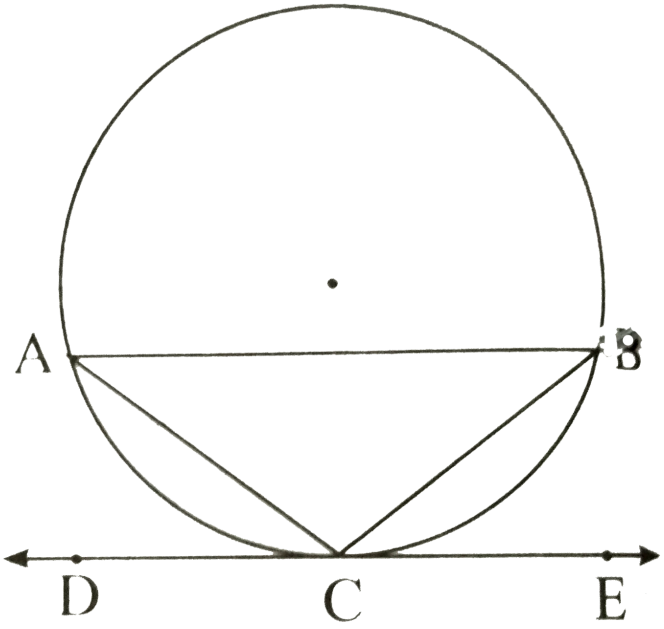
2. In the figure, chord $AB \mid\mid$ tangent DE. Tangent DE touches the circle at point C then prove AC = BC.



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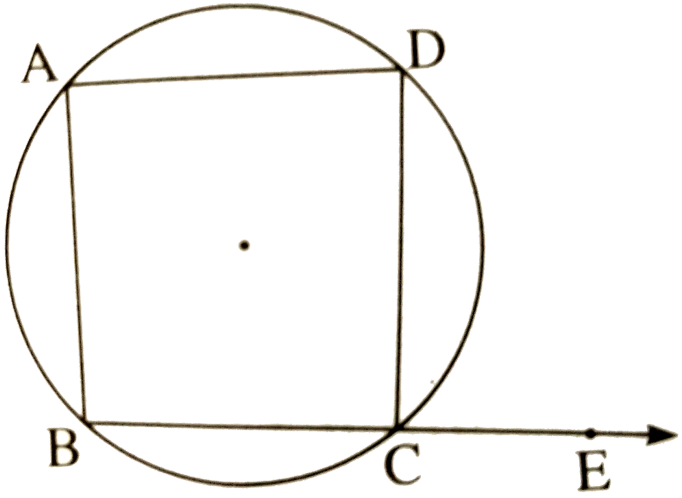
3. Given :

□ ABCD is cyclic. $\angle DCE$ is an exterior angle of □ ABCD.

To Prove : $\angle DCE = \angle BAD$

Complete the proof by filling the boxes.



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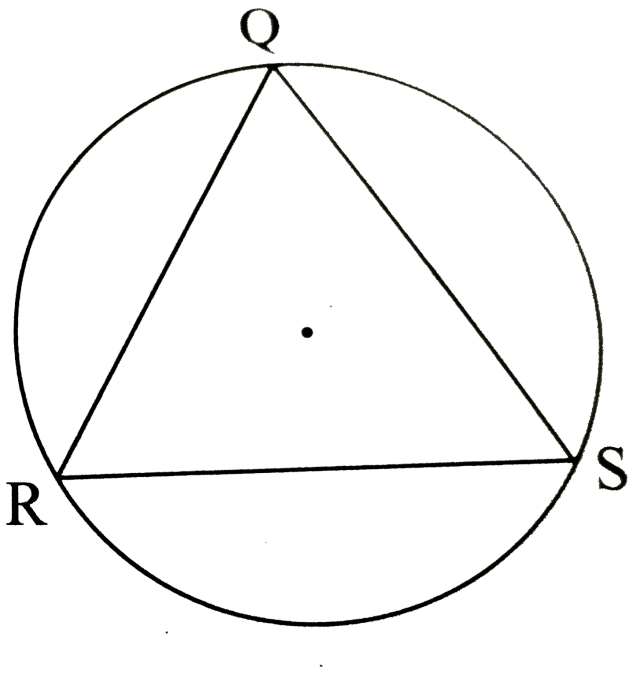
4. In the figure , ΔQRS is an equilateral triangle.

Prove that

(1) arc RS $\cong arcQS \cong$ arc QR

(2) m (arc QRS) $= 240^\circ$.

Proof :



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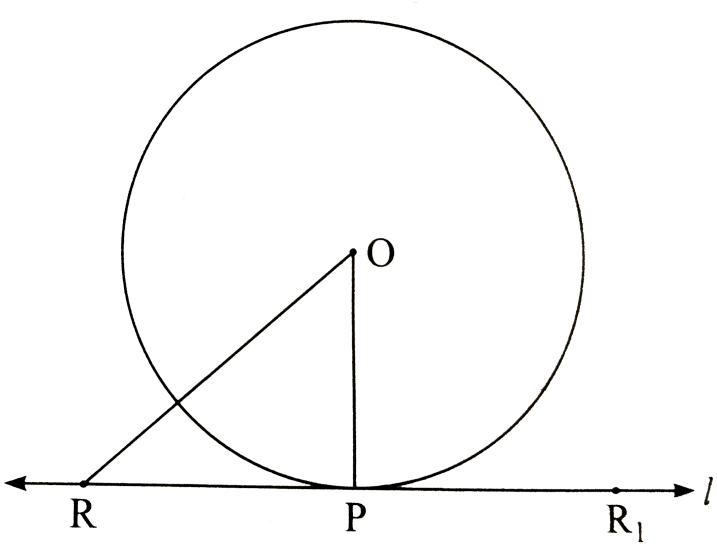
5. Line l touches a circle with centre O at point P. If radius of the circle is 9 cm, answer the following :

(1) What is d(O,P) = ? Why ?

(2) If d(O,Q) = 8 cm , where does the point Q lie ?



(3) If d(O,R) = 15 cm , how many locations of point R are line on line l ? At what distance will each of them be from point P?

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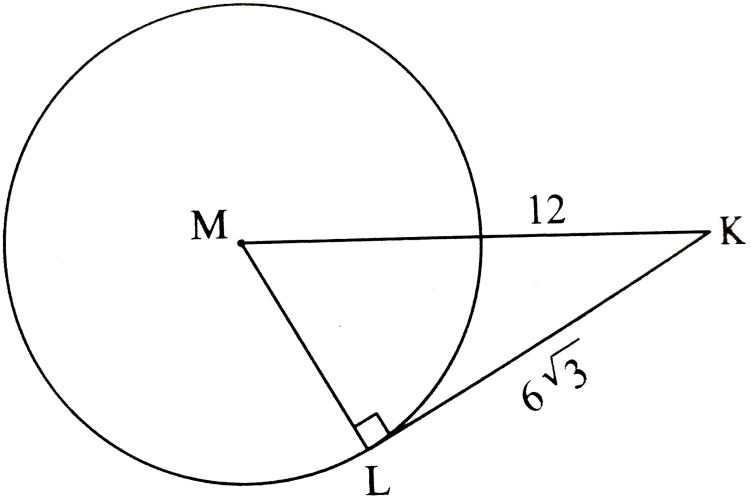
6. In the figure, M is the centre of the circle and seg KL is a tangent segment. If $MK = 12, KL = 6\sqrt{3}$ then find,

(1) Radius of the circle,

(2) Measures of $\angle K$ and $\angle M$.



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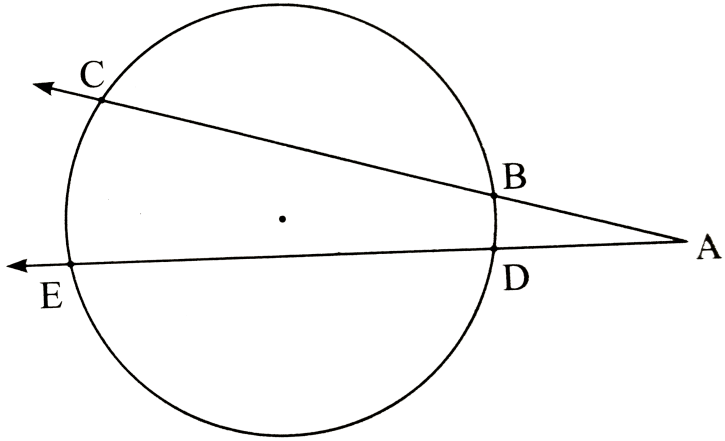
7. In the figure,

(1) m (arc CE) $= 54^\circ$, m (arc BD) 23°, find measure of $\angle CAE$.

(2) If AB = 4.2 , BC = 5.4 , AE = 12.0, find AD .

(3) If AB = 3.6, AC = 9.0 , AD = 5.4 , find AE.



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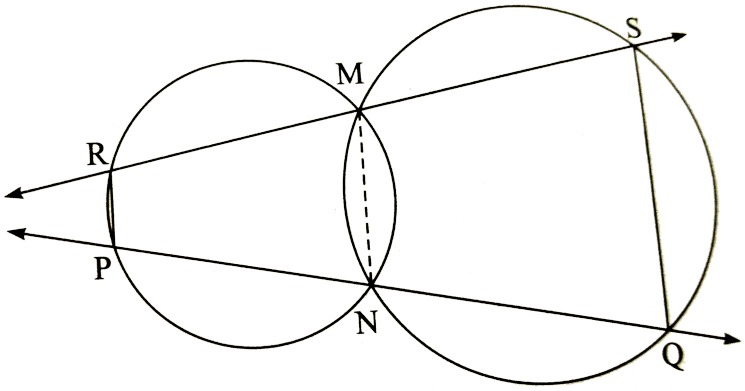
8. In the figure, two circles intersect at points M and N. Secants drawn through M and N intersect the circles at points R,S and P,Q respectively. Prove that : seg SQ ||

seg RP.



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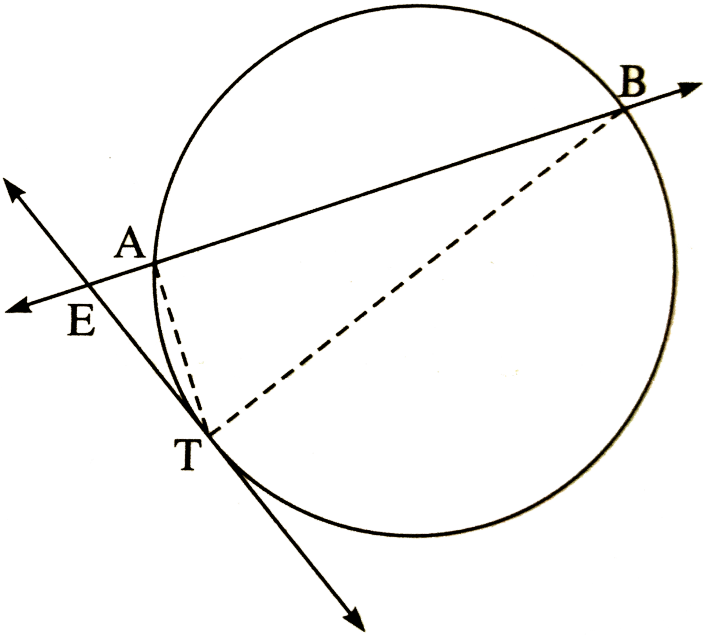
9. Given : Line ET is tangent to the circle at point E. Line EAB is secant intersecting at point A and B.

To Prove : $ET^2 = EA \times EB$

Construction : Draw seg BT and Seg AT

Complete the proof by filling the boxes.



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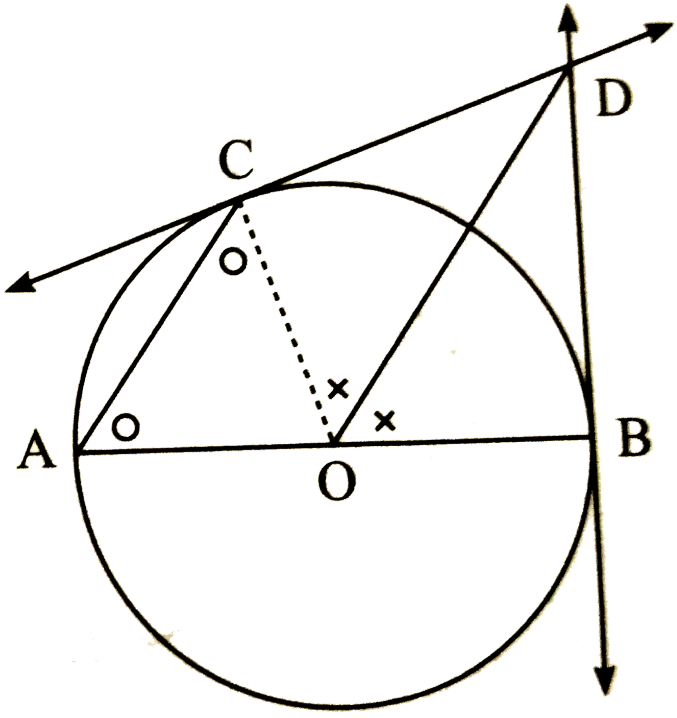
4.5 (1 mark each)

1. In the figure, O is the centre of the circle . Seg AB is the diameter at the point C on the circle the tangent CD is drawn. Line BD is a tangent to the circle at point B. Show that seg OD || chord AC.



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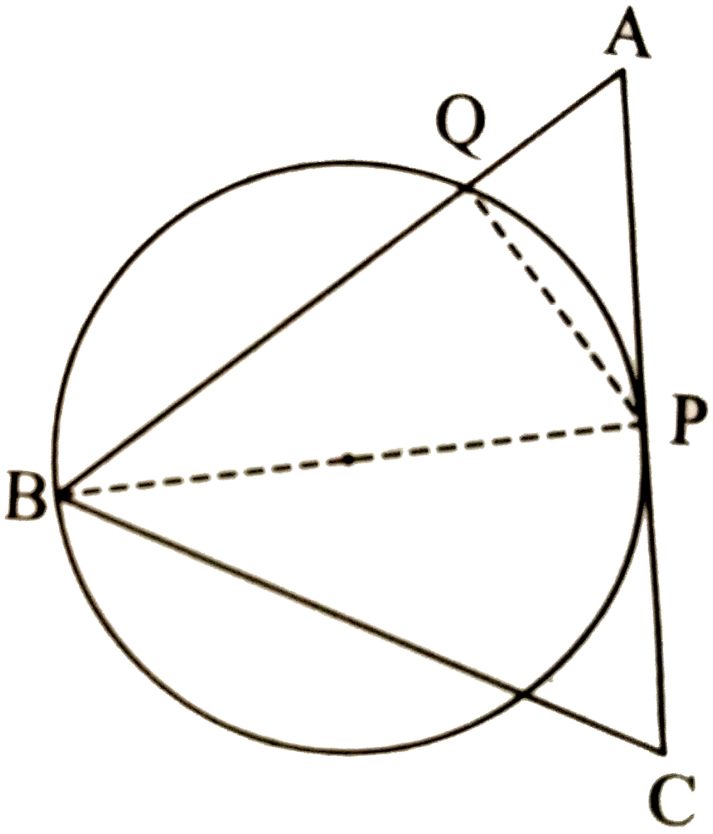
2. In $\Delta ABC, AB = AC.$ A circle passing through B touches side AC at its midpoint P and intersects side AB at Q then prove BQ = 3AQ

Construction : Draw seg BP and seg PQ



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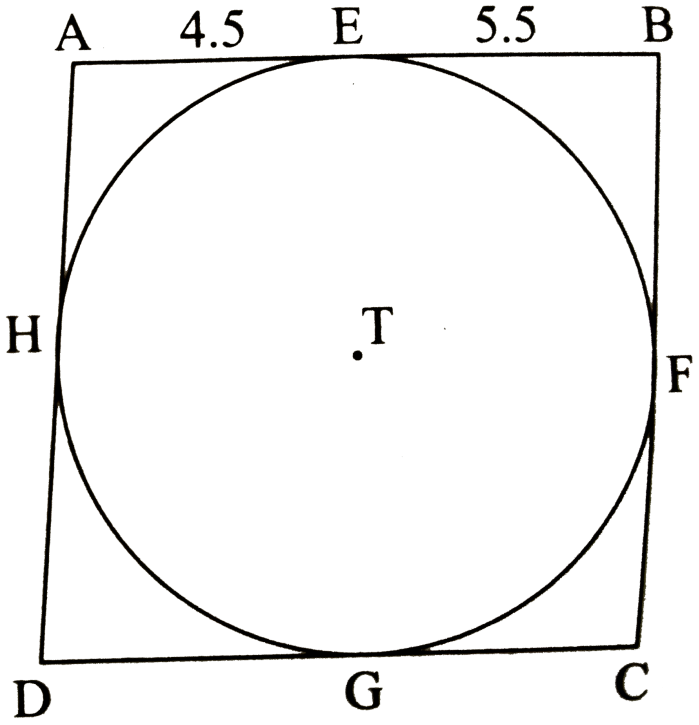
3. In the figure, $\square ABCD$ is a parallalogram. It circumscribes the cirlcle with centre T. Point E,F,G,H are touching points. If AE = 4.5 ,EB = 5.5 , find AD.



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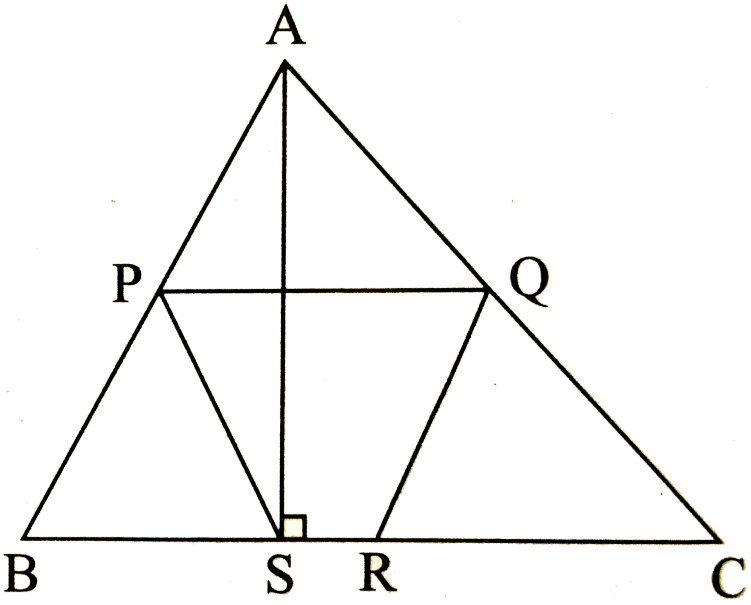
4. In ΔABC, P,Q and R are midpoints of sides AB,AC and BC respectively. Seg $AS \perp BC$ and PQ || BR side BC. Prove that $\square$ PQRS is a cyclic quadrilateral.



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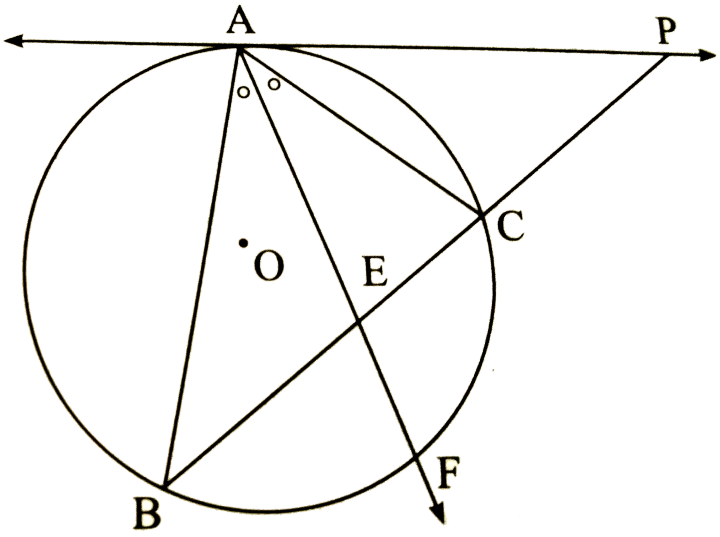
5. ΔABC is inscribed in a circle with centre O and line AP is a tangent at the point A. Ray AF is the bisector of $\angle BAC$

Prove that seg $AP \cong$ seg PE.



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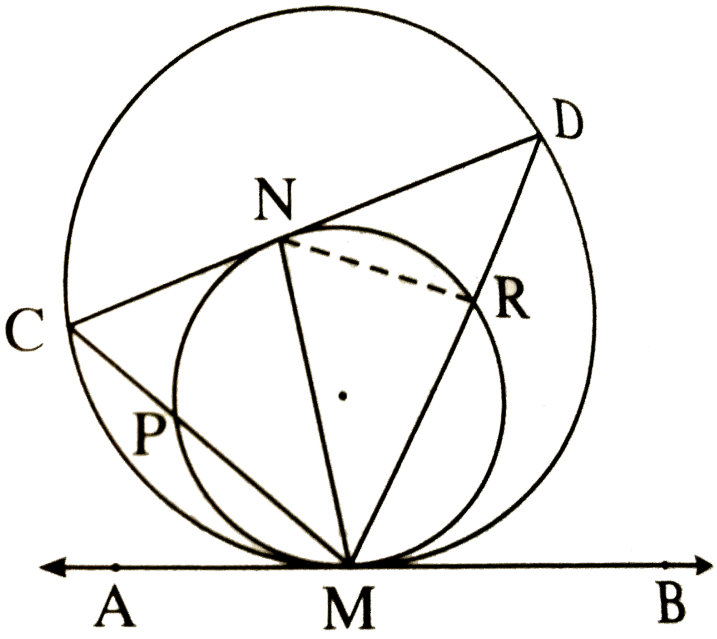
6. Let M be a point of contact of two internally touching circles. Let line AMB be their common tangent. The chord CD of the bigger circle touches the smaller circle at the point N. Chord CM and chord DM of the bigger circler intersect the smaller circle at the points P and R respectively.

Prove that $\angle CMN \cong \angle DMN$.

Construction : Draw seg NR.



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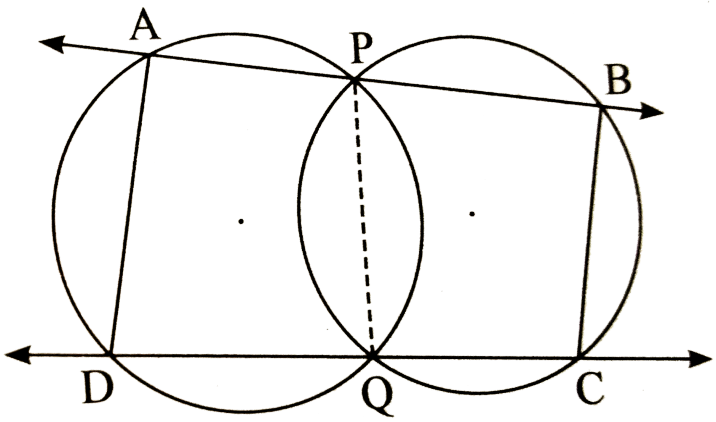
7. Two circles intersect each other at point P and Q. Secants drawn through p and Q intersect the circles at points A,B and D,C

Prove that : $\angle ADC + \angle BCD = 180^\circ$



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ASSIGNMENT 4.1

1. The angle made by the tangent and the radius made at the point of contact is

A. 0°

B. 45°

C. 90°

D. 75°

Answer: C

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2. A tangent AB, at a point A of a circle of radius 5 cm, meets a line through the centre O at point B such that OB =12 cm. Length AB is

A. 5 cm

B. 12 cm

C. 13 cm

D. $\sqrt{19}$ cm

Answer: D

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3. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 70°, then $\angle POA$ is equal to

A. 70°

B. 55°

C. 100°

D. 40°

Answer: B

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4. If TP and TQ are two tangents to a circle with centre O, so that $\angle POQ = 120^\circ$, then $\angle PTQ$ is equal to

A. 120°

B. 30°

C. 60°

D. 90°

Answer: C

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5. AP is tangent to the circle with centre O at point A. OP =10 cm and $\angle OPA = 30^\circ$. The radiu of the circle is

A. 10 cm

B. $5\sqrt{3}$cm

C. 5 cm

D. $10\sqrt{3}cm$

Answer: C

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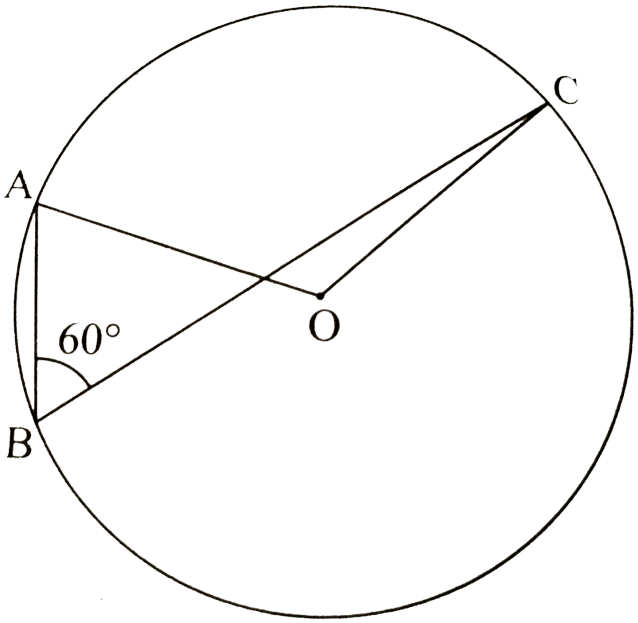
6. In the figure, if $\angle ABC = 60^\circ$, then $\angle AOC =$



A. 120°

B. 60°

C. 30°

D. 90°

Answer: A

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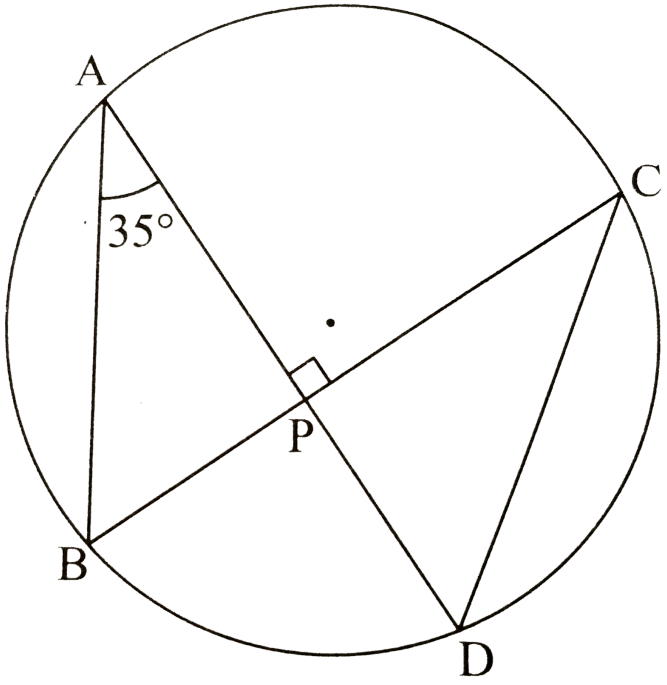
7. In the figure, chords AD and BC intersect each other at right angles at a point P. If $\angle DAB = 35^\circ$, then $\angle ADC =$



A. 35°

B. 55°

C. 65°

D. 45°

Answer: B

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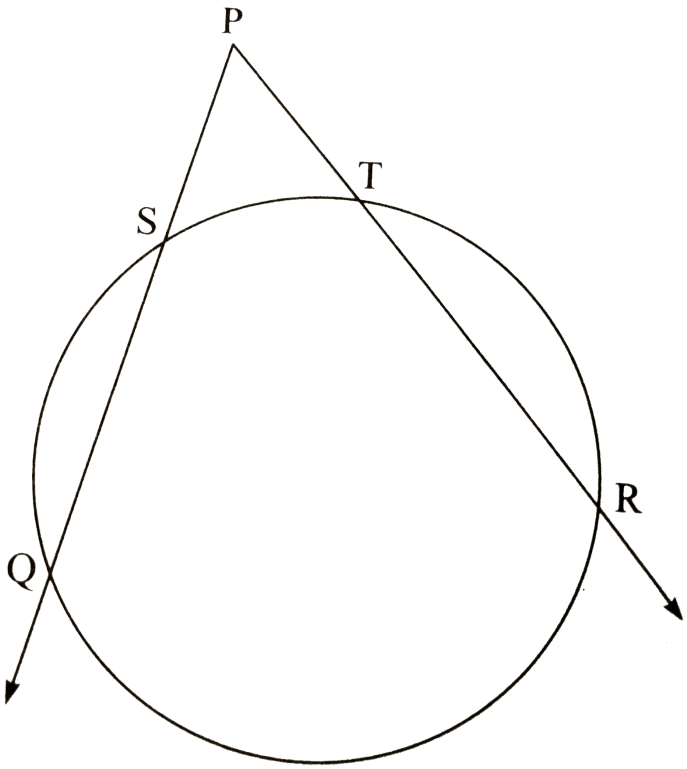
8. In the figure , $\angle QPR$ has its vertex outside the circle such that m (arc QR) = 200° and m (arc ST) $= 90^\circ$,

then $\angle QPR = ?$



A. 45°

B. 100°

C. 110°

D. 55°

Answer: D

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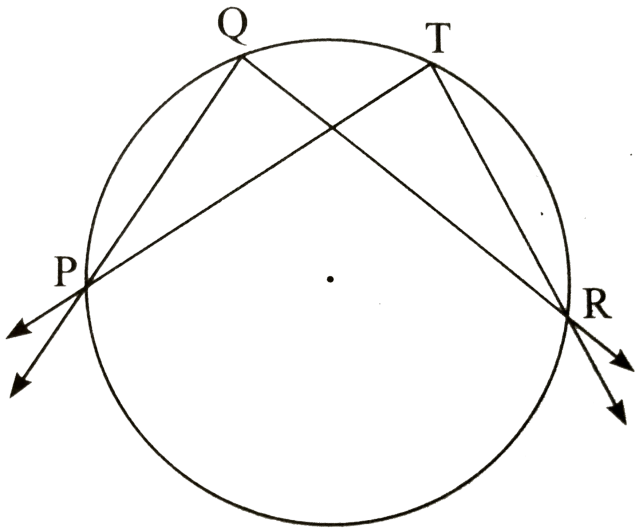
9. In the figure, $\angle PQR = 85^\circ$ then find the measure of $\angle PTR$.



A. 75°

B. 180°

C. 90°

D. 85°

Answer: D

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10. In the figure , $\angle ABC = 80^\circ$ then find the measure of $m(arcAPC)$.

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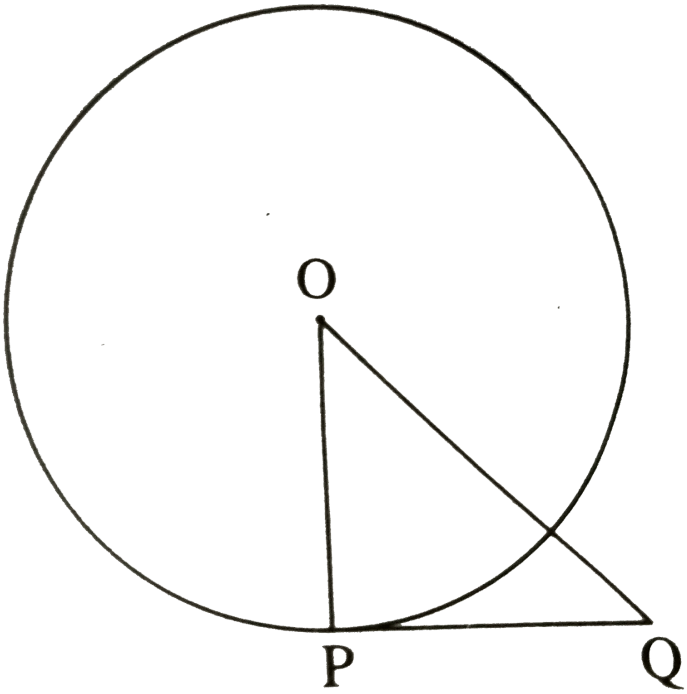
ASSIGNMENT 4.2

1. In the figure,O is the centre of the circle PQ is the tangent at point P then what is the measure of $\angle OPQ$? Why ?



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2. Two circles with radii 5cm and1.5 cm touch each other internally then find the distance between their centres.

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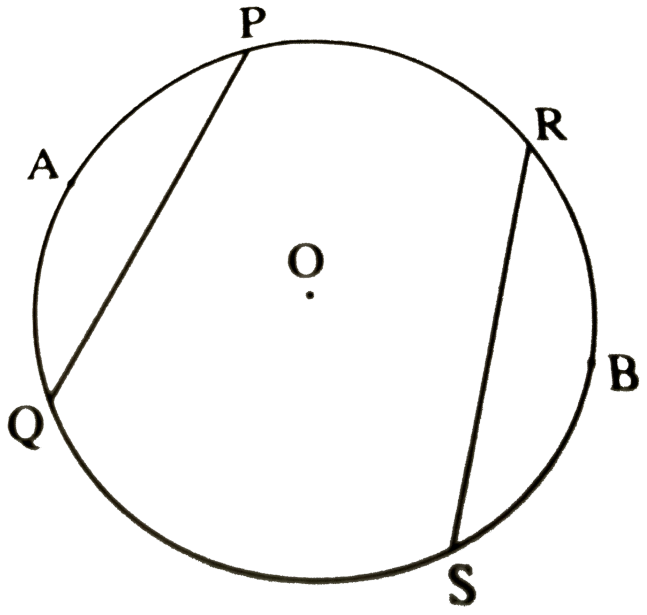
3. In the figure, m (arc PAQ) =m (arc RBS) $= 130^\circ$ chord PQ has length 10cm then what is the length of

chord RS ? Why ?



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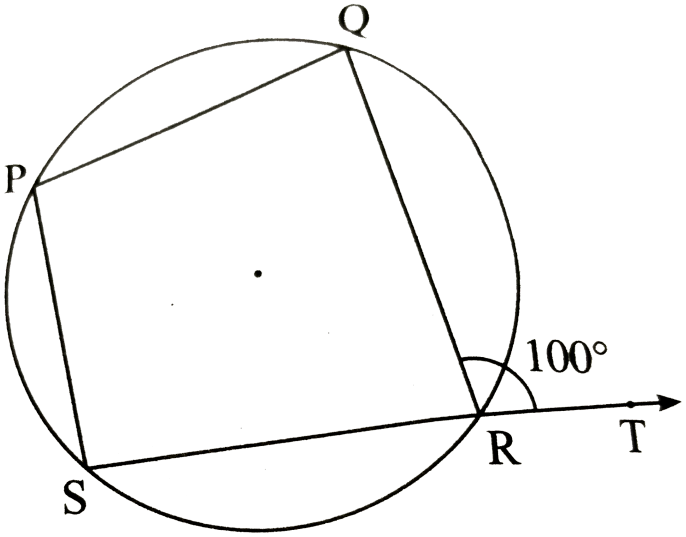
4. □ PQRS is cyclic .T is a point of ray SR such that S-R-T and $\angle QRT100^\circ$ then what is the measure of $\angle SPQ$?

Why ?



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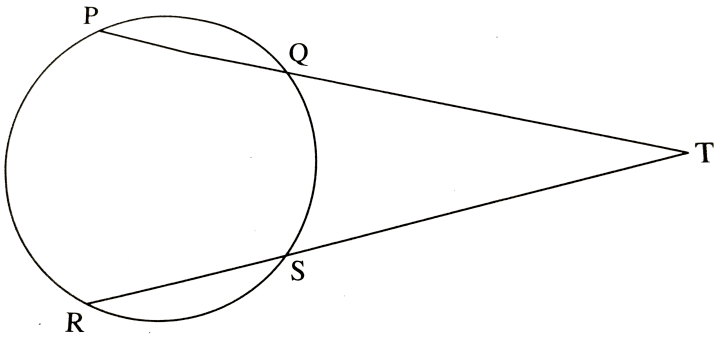
5. In the figure , chords PQ and RS intersect at point T outside the circle then by theorem of external division of chords,

$PT \times \square = ST \times \square$



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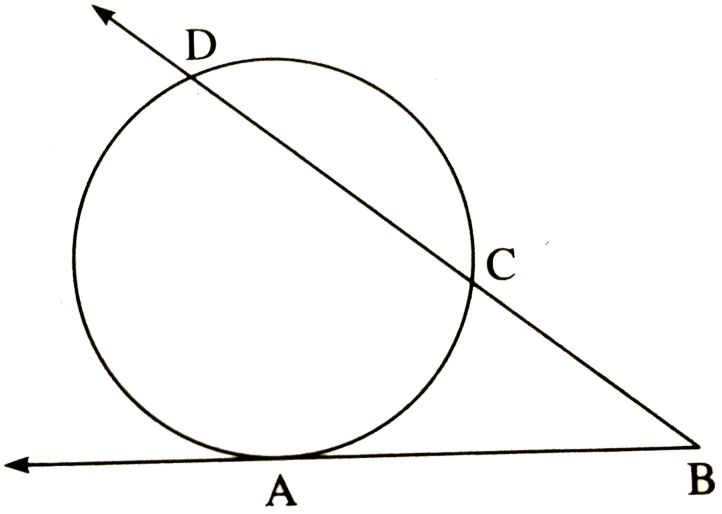
6. Ray BA is tangent at point A . Ray BD is secant intersecting the circle at points C and D then

$BA^2 = \square \times \square$



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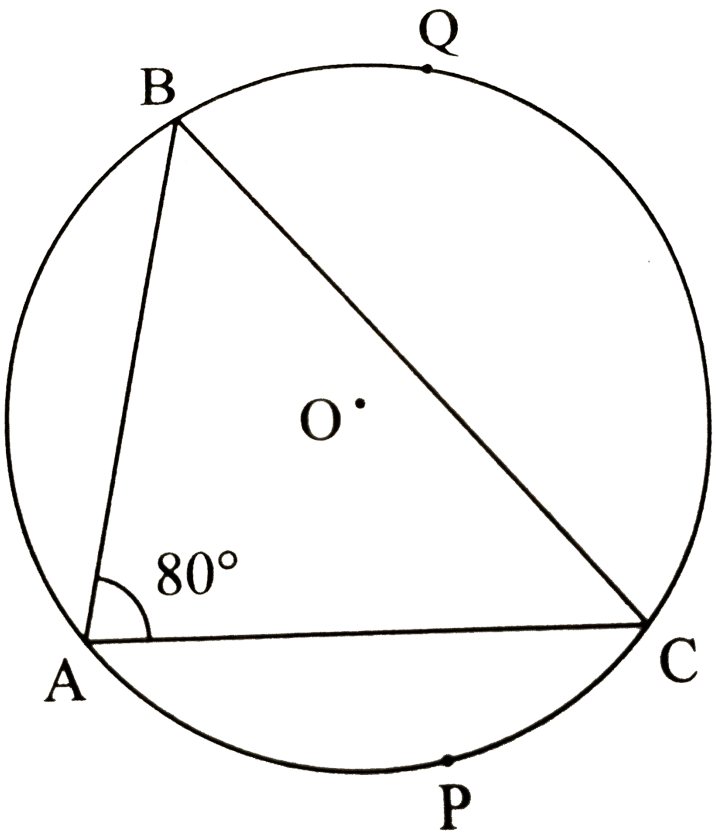
ASSIGNMENT 4.3

1. In the figure, O is the centre of the circle , $\angle BAC = 80^\circ$, m (arc APC) $= 60^\circ$ then find the

measure of

(i) $\angle ABC$ (ii) arc BQC



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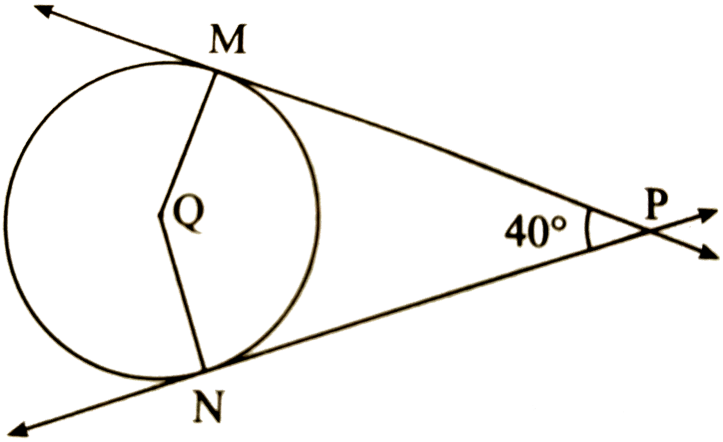
2. In the figrure, Q is the centre of the circle and PM and PN are tangent segments to the circle. If $\angle MPN = 40^\circ$, find $\angle MQN$



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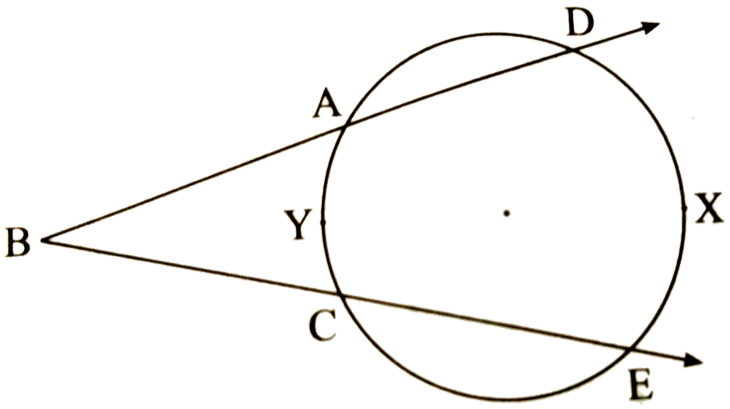
3. In the figure , if m (arc DXE 0 =100° and m (arc AYC) $= 40^\circ$, find $\angle DBE.$



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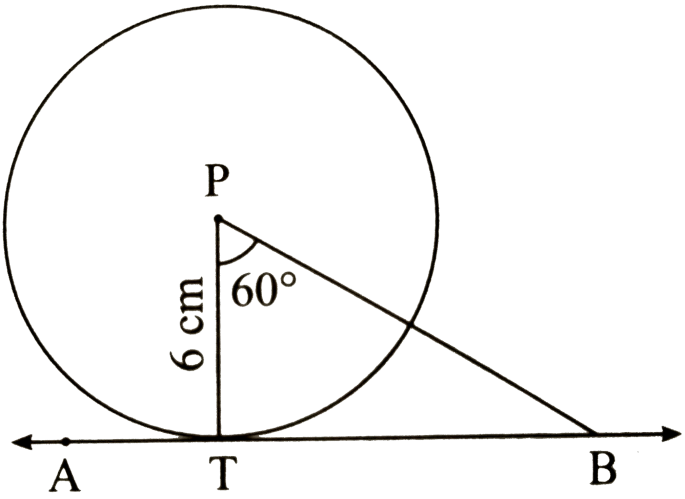
4. In the figure, point P is the centre of the circle and line AB is the tangent to the circle at the point T. The radius

of the circle is 6 cm . Find PB, if $\angle TPB = 60^\circ$



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5. $\square MRPN$ is cyclic , $\angle R = (5x - 13)^\circ, \angle N = (4x + 4)^\circ$.Find measures of $\angle R$ and $\angle N$.

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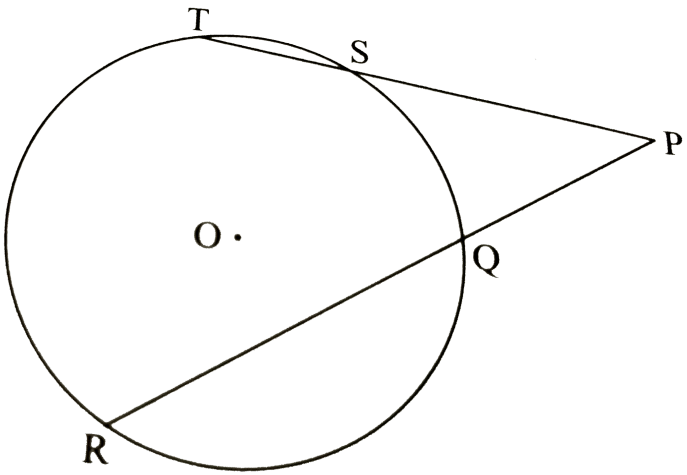
6. In the figure, if $PQ = 6, QR = 10, PS = 4$, find TS



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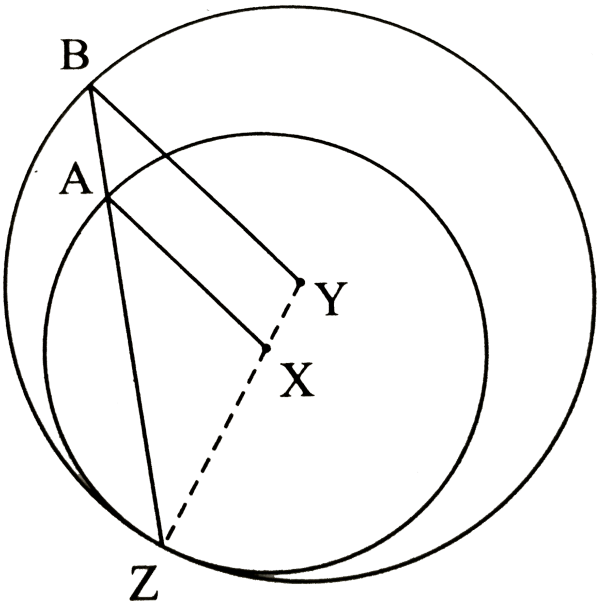
7. In the figure, circles with centres X and Y touch internally at point Z. Seg BZ is a chord of bigger circle and it intersects smaller circlea t point A. Prove that , seg

AX || seg BY



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8. In the figure, chord EF || chord GH.

Prove that ,

chord EG $\cong$ chord FH .

Fill in the blanks and write the proof .

Proof : Draw seg GF.

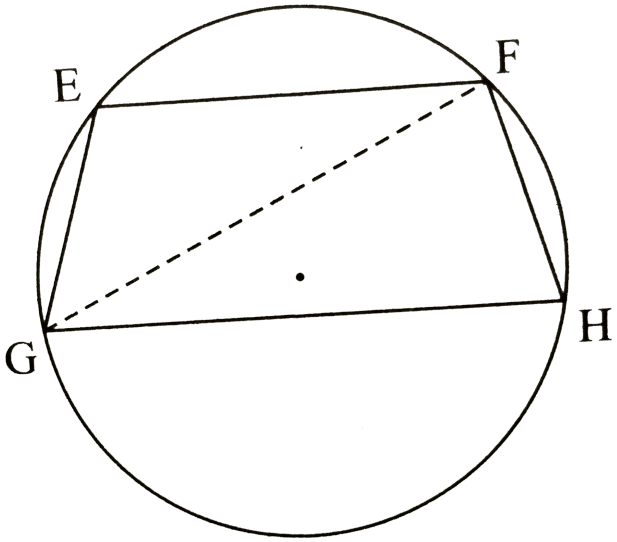
$\angle EFG = \angle FGH$ ....($\square$) .....(1)

$\angle EFG = \square$ ...(Inscribed angle theorem) ...(2)

$\angle FGH = \square$ ....(Inscribed angle theorem) ...(3) ,brgt $\therefore$

m (arc EG) $= \square$ ....[From (1), (2) and (3)]

$\therefore$ Chord EG $\cong$ Chord FGH ....(Corresponding chords of congruent arcs)



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9. In the figure, m (arc LN) $= 110^\circ$, m (ar PQ) = 50°

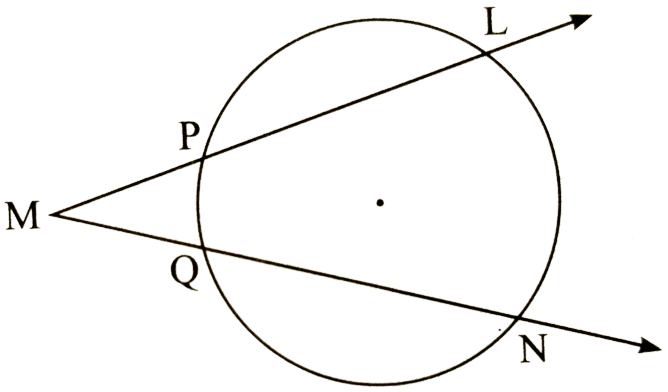
then complete the following activity to find $\angle LMN$

$$\angle LMN = \frac{1}{2}[m(arcLN) = \ - \ \square]$$

$$\therefore \angle LMN = \frac{1}{2}[\square \ - 50^\circ]$$

$$\therefore \ LMN = \frac{1}{2} \times \square$$

$$\therefore \angle LMN = \square$$



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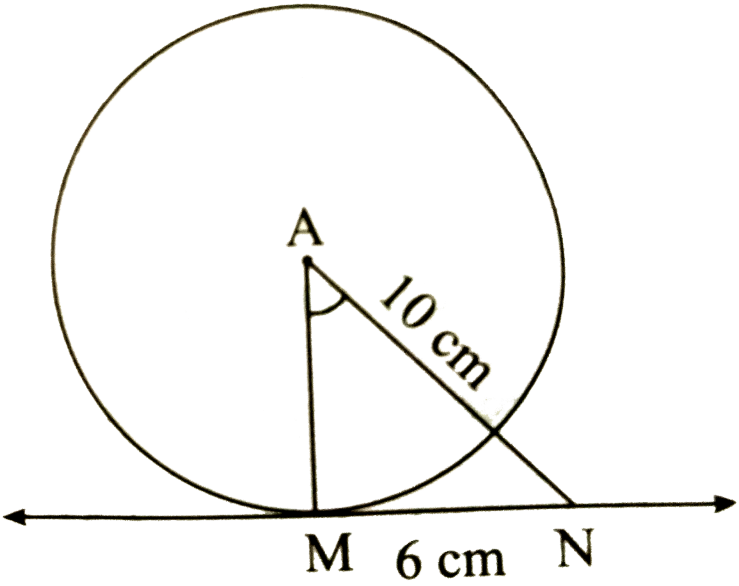
10. In the figure, A is the centre of the circle. AN = 10 cm . Line MN touches the circles in point M. If MN = 6 cm then find the radius of the circle.



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11. Two circles intersect each other in points A and B. Seg AB is the chord of both the circles . Point C is in the exterior point of both the circles on the line AB. From the point C tangents are drawn to the circles touching at M and N as shown. Completely the following to prove CM= CN.

Proof :

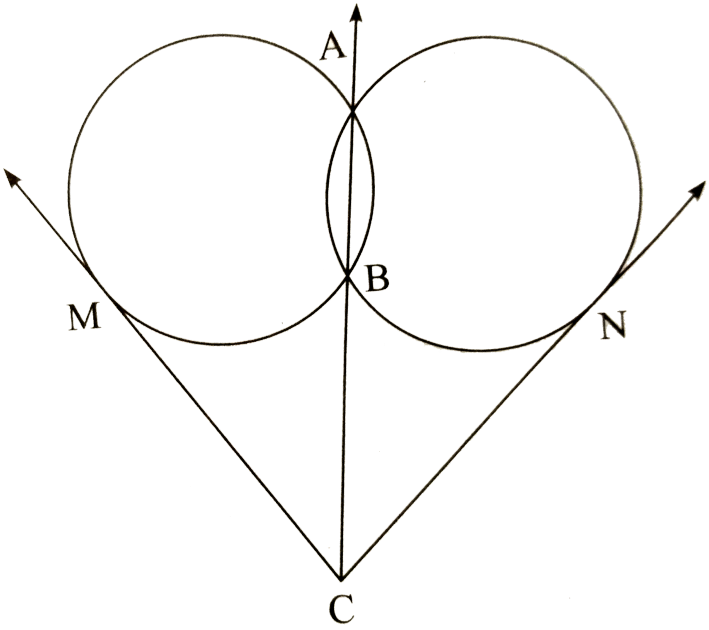
$CM^2 = CA \times \square$ ....($\square$) ....(1)

$CN^2 = \square \times CB$ ...(Tangent secant segment property) ....(2)

$\therefore$ From (1) and (2),

$CM^2 = \square$

$\therefore CM = CN$



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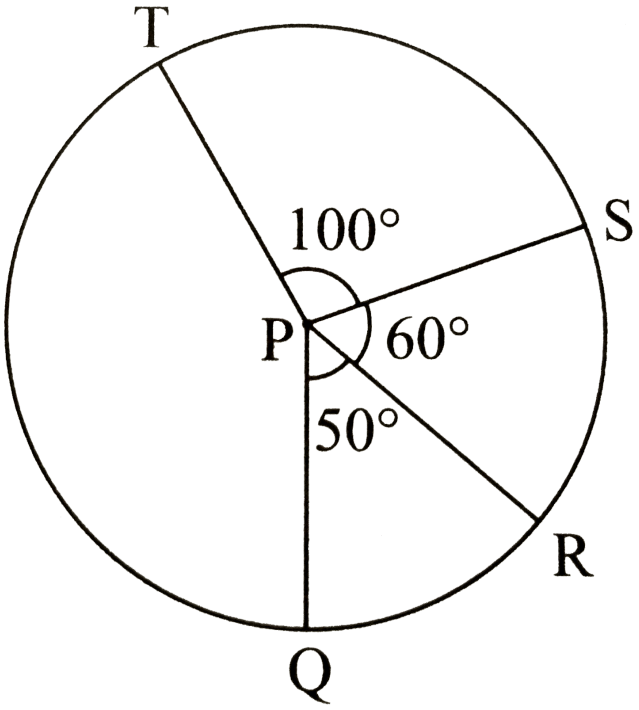
ASSIGNMENT 4.4

1. In the figure, P is the cnetre of the circle. If $\angle QPR 50^\circ$, $\angle RPS = 60^\circ$, $\angle SPT = 100^\circ$ then find

(1) m(arc QRS) (ii) m (arc QST) (iii) m (arc RTS)



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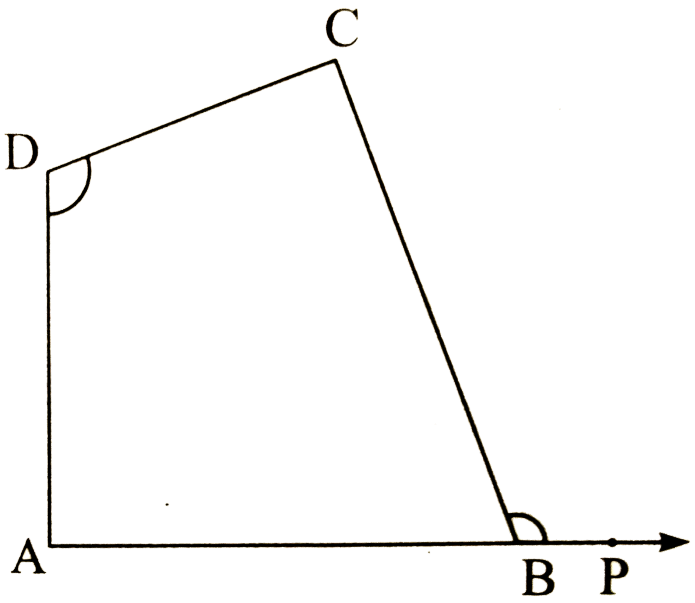
2. In the figure, if $\angle ADC = \angle CBP$ then prove that $\square ABCD$ is cyclic.



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3. square ABCD is a cyclic quadrilateral in which AB = AD . $\angle BCD = 70^\circ$. Find (i) m (arc BCD) (ii) m (arc BAD) (III)

$\angle ADB$

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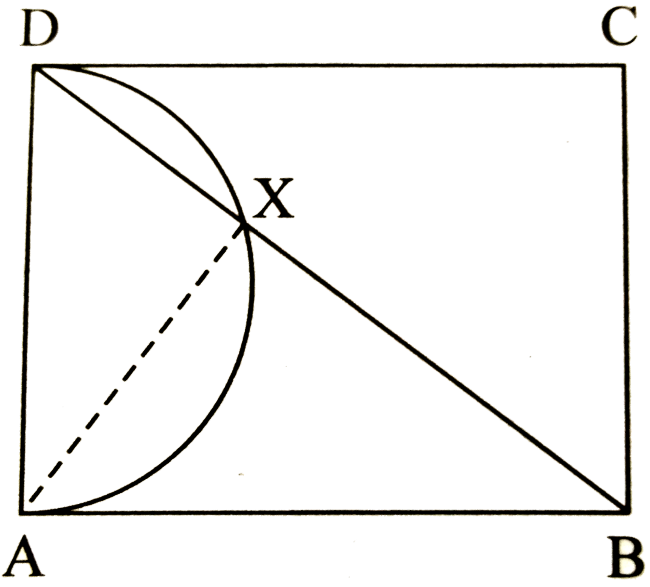
4. $\square ABCD$ is a rectangle. Taking AD as a diameter a semicircle AXD is drawn which intersets diagonal BD at X. If AB = 12 cm , AD == 9 cm , find the values of (i) BD (ii) BX.



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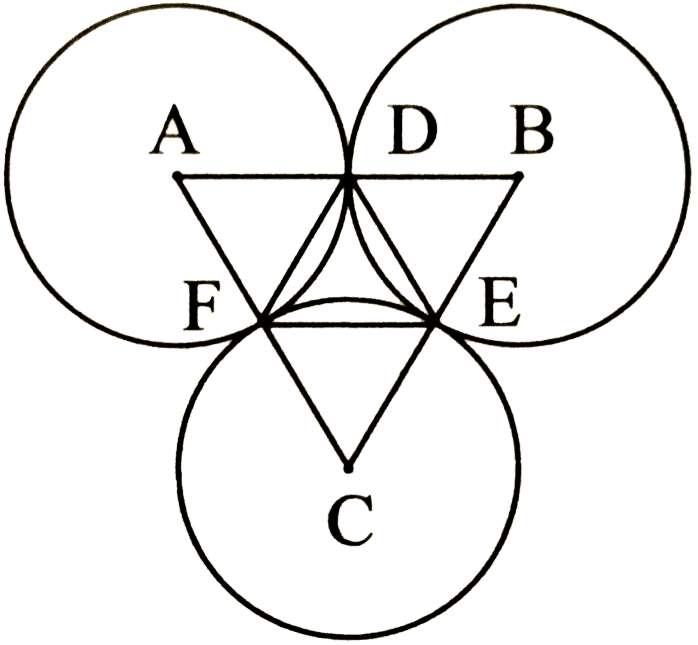
5. Circles with centres A,B,C and radius 5 cm each, touch each other externally in the points D,E, and F as shown in the figure.

(i) What is the perimeter of ΔABC?

(ii) What is the length of side of side DE and ΔDEF?



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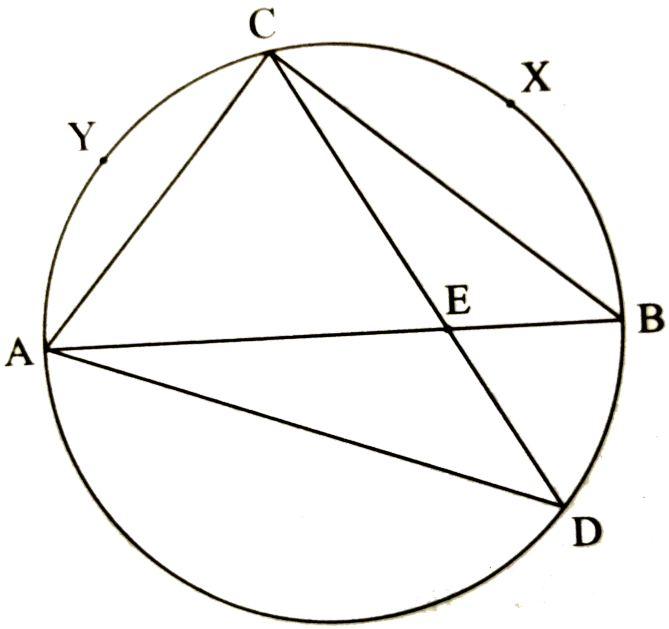
6. In the figure, diameter AB and chord CD intersect in point E.

If m (arc CXB) = 100°. Find

(i) $\angle ADC$

(ii)$\angle CDB$

(iii) $\angle ACB$



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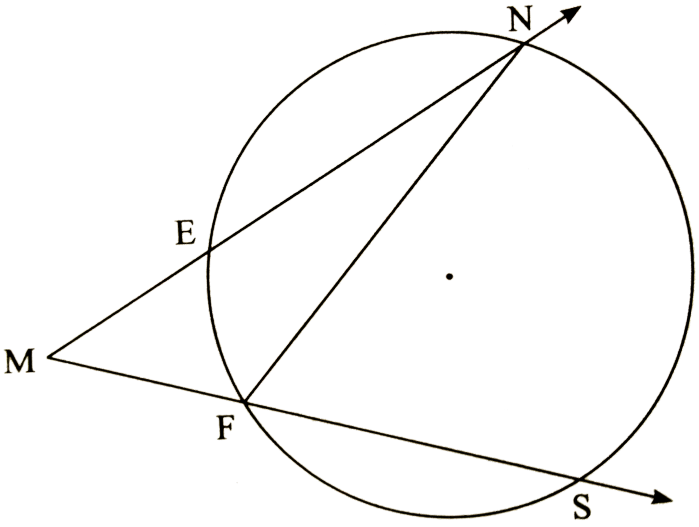
7. In the figure, m (arc NS) $= 130^\circ$

m (arc EF) $= 60^\circ$. Find

(i) $\angle NMS$

(ii) $\angle ENF$

(iii) $\angle NFS$



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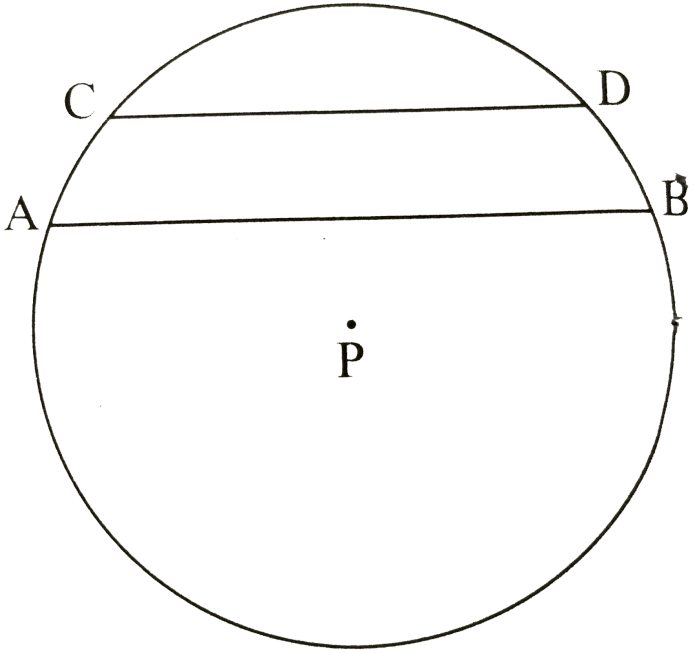
8. In the figure, two chords AB and CD are parallel to each other. P is the centre of the circle.

Show that $\angle CPA \cong \angle DPB$.



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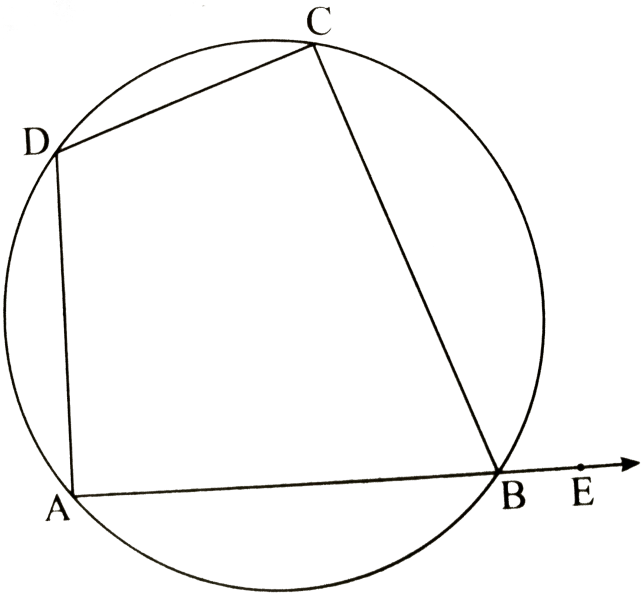
9. $\square ABCD$ is a cyclic quadrilateral, m (arc ABC) $=220^\circ$

then find $\angle ABC$, $\angle CDA$ and $\angle CBE$



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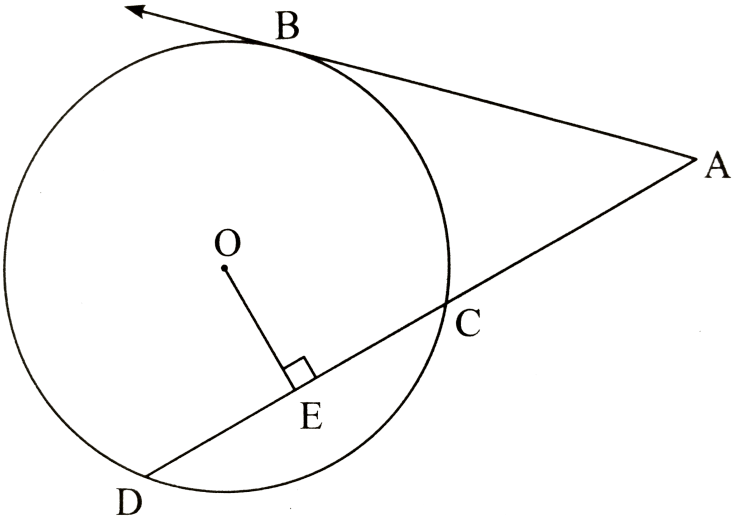
10. In the figure, O is the centre of the circle and B is a point of contact. Seg OE $\perp$ seg AD, AB = 12, AC = 8, find

(i) AD (ii) DC (iii) DE.



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11. In the figure , O is the radius of the circle. From point R, seg RM and seg RN are tangent segments touching the circle at M and N. If OR = 10cm and radius of the circle = 5 cm, then (i) What is the length of each tangent

segment ? (iii) What is the measure of $\angle MRO$? (iii) What is the measure of $\angle MRN$?

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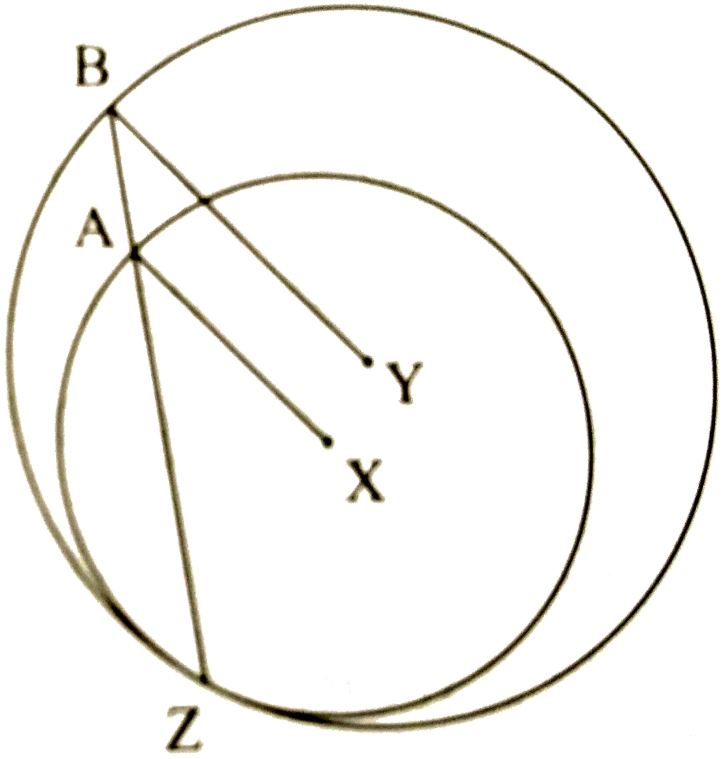
12. In the figure , circles with centres X and Y touch internally at point Z. Seg BZ is the chord of bigger circle and it intersects smaller k circle at point A.

Prove that seg AX | | seg BY.



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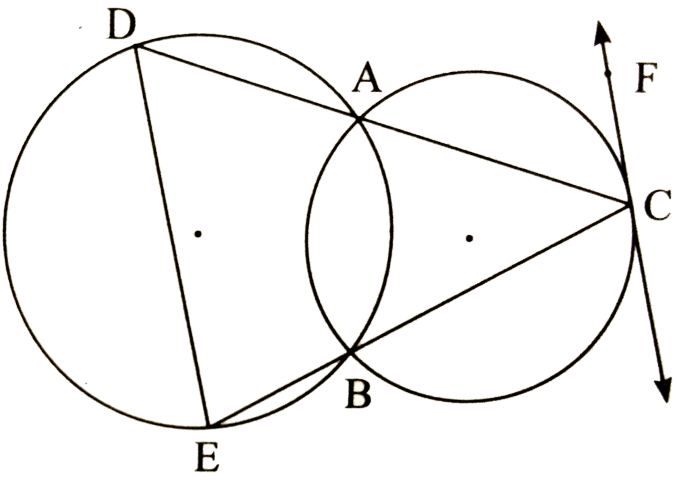
ASSIGNMENT 4.5

1. In the figure, two circles intersect each other at points A and B . C is a point on the smaller circle. Secant CA and secant CB of the smaller circle intersect the bigger circle at points D and E respectively then prove : seg DE || line CF



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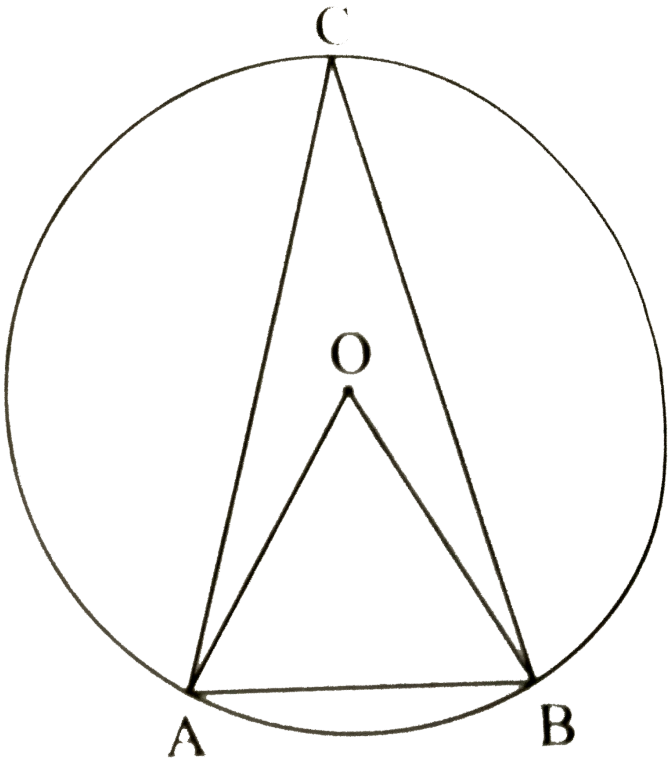
2. In the figure , in a circle with centre O, length of chord AB is equal to the radius of the circle. Find the measure of each of the following :

(1) $\angle AOB$

(2) $\angle ACB$

(3) arc AB

(4) arc ACB



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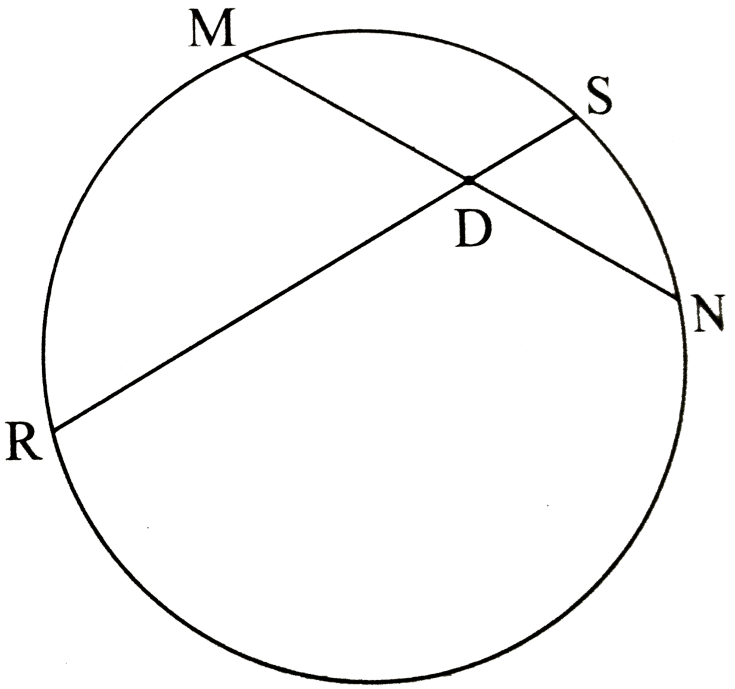
3. In the figure, chord MN and chord RS intersect at point D.

(1) If RD = 15, DS = 4, MD = 8 , find DN.

92) If RS = 18, MD = 9 , DN = 8 , find DS .



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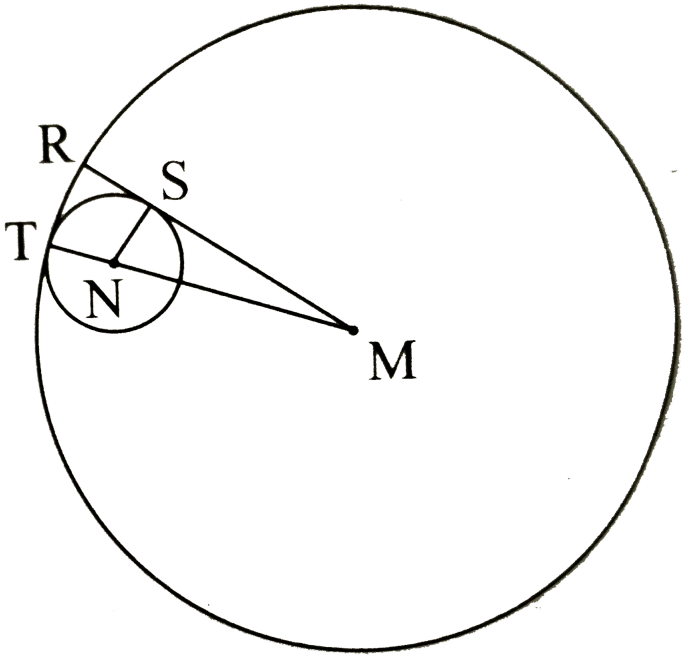
4. In the figure, circle with centre M touches the circle with centre N at point T. Radius RM touches the smaller

circle at S. Radii of circles are 9 cm and 2.5 cm. Find the answers to the following questions hence find the ratio MS : SR

(1) Find the length of segment MT

(2) Find the length of seg MN

(3) Find the measure of $\angle NSM$.



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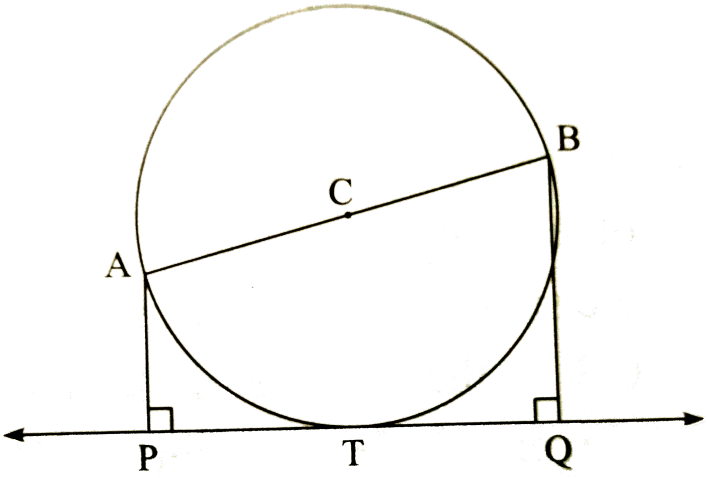
5. In the figure, seg AB is a diameter of a circle with centre C. Line PQ is a tangent , which touches the circle at point T. seg AP $\perp$ line PQ and seg $BQ \perp$ line PQ. Prove that, seg $CP \cong$ seg CQ.



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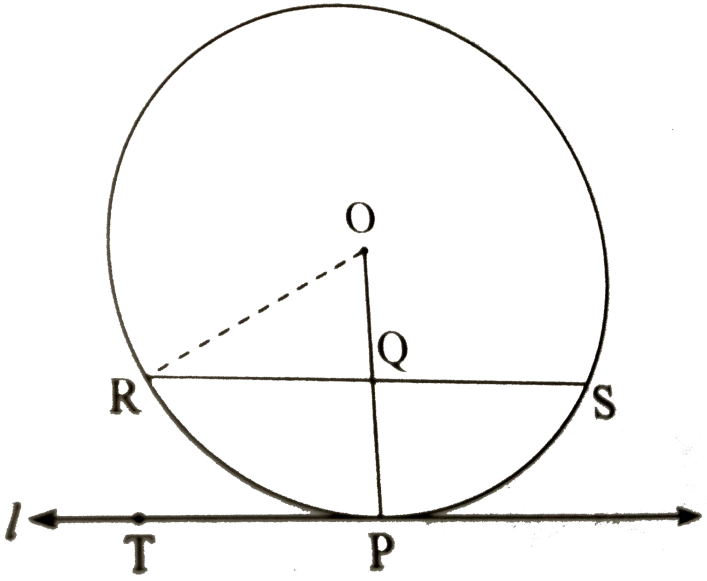
6. In the figure, line l touches the circle with centre O at point P. Q is the midpoint of radius OP. RS is a chord thorugh Q such that chords RS || line l. If RS = 12 , find the radius of the circle.



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7. Prove the any three points on a circle cannot be collinear .

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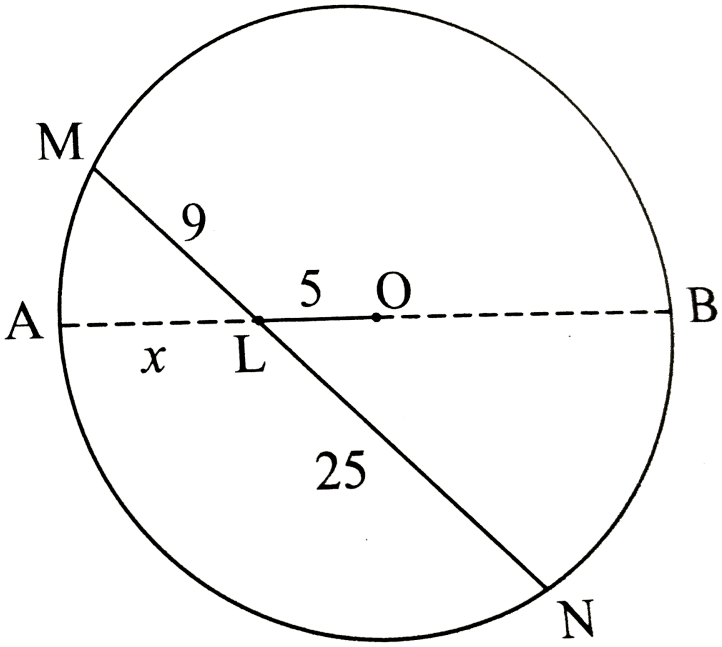
8. In the figure, seg MN is a chord of a circle with centre O. MN = 15, L is a point on chord MN such that ML = 9

and d(O, L) = 5. Find the radius of the circle.



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EXAMPLES FOR PRACTICE

1. How many circles can be drawn to pass through three non-collinear points 1 (b) 2 (c) 0 (d) as many as possible

A. 1

B. 0

C. 2

D. 3

Answer: A

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2. A tangent AB, at a point A of a circle of radius 5 cm, meets a line through the centre O at point B such that

OB =12 cm. Length AB is

A. 5 cm

B. 12 cm

C. 13 cm

D. $\sqrt{119}$ cm

Answer: D

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3. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 70°, then $\angle POA$ is equal to

A. 70°

B. 55°

C. 100°

D. 40°

Answer: B

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4. If TP and TQ are two tangents to a circle with centre O , so that $\angle POQ = 120^\circ$, then $\angle PTQ$ is equal to

A. 120°

B. 30°

C. 60°

D. 90°

Answer: C

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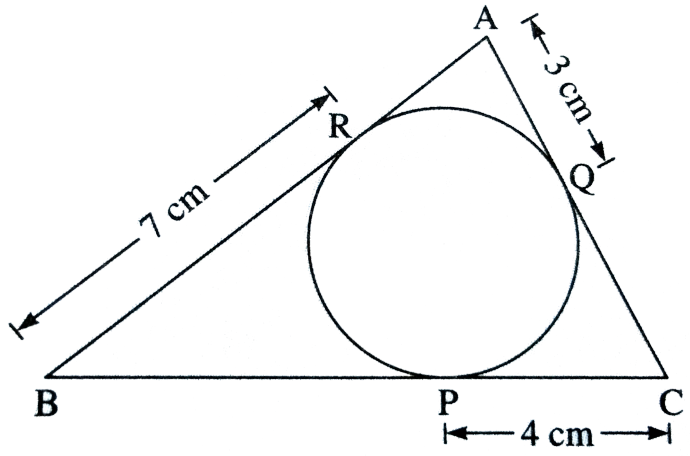
5. In the figure, sides of $\triangle ABC$ are tangents to the circle touching the circle at points P, Q abd R as shown. If AQ=3 cm, BR=7 cm and PC= 4 c m, then perimeter of

$\triangle ABC$ is



A. 14 cm

B. 28 cm

C. 20 cm

D. connot be determined

Answer: B

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6. AP is tangent to the circle with centre O at point A. OP =10 cm and $\angle OPA = 30^\circ$. The radiu of the circle is

A. 10 cm

B. $5\sqrt{3}$ cm

C. 5 cm

D. $10\sqrt{3}$ cm

Answer: C

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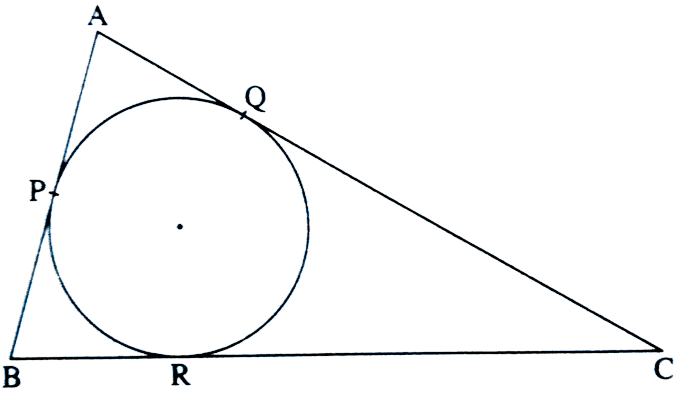
7. In the given figure, if AP= PB, then



A. AC=AB

B. AC=BC

C. AB=BC

D. AQ=QC

Answer: B

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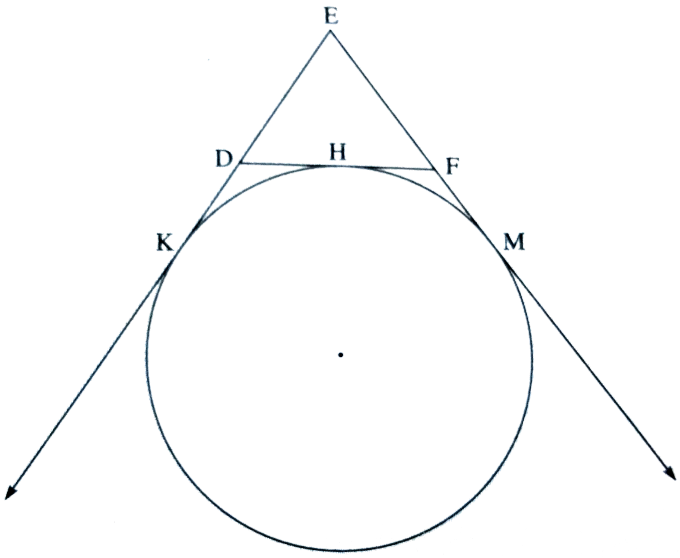
8. In the figure, a circle touches the side DF of $\triangle EDF$ at H and touches line ED and EF at points K and M respectively. If EK =9cm , then perimeter of $\triangle EDF$ is



A. 18 cm

B. 9 cm

C. 13.5 cm

D. connot be determined

Answer: A

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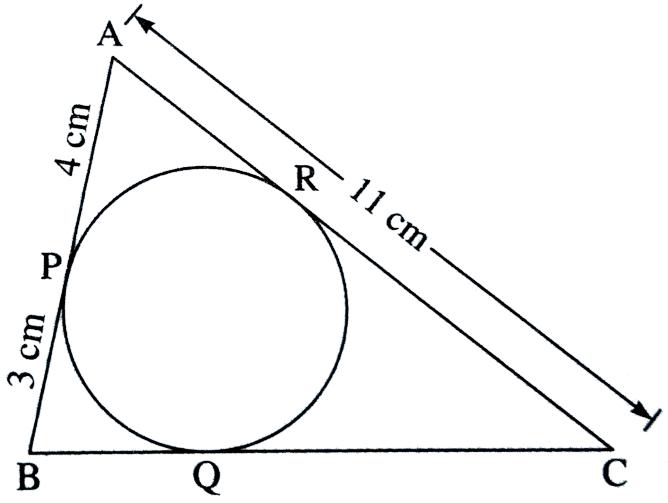
9. The side AB, BC and CA of triangle ABC touch a circle at P,Q and R respectively. If PA =4 cm, BP=3 cm and AC=11 cm, then length of BC is



A. 11 cm

B. 10 cm

C. 14 cm

D. 15 cm

Answer: B

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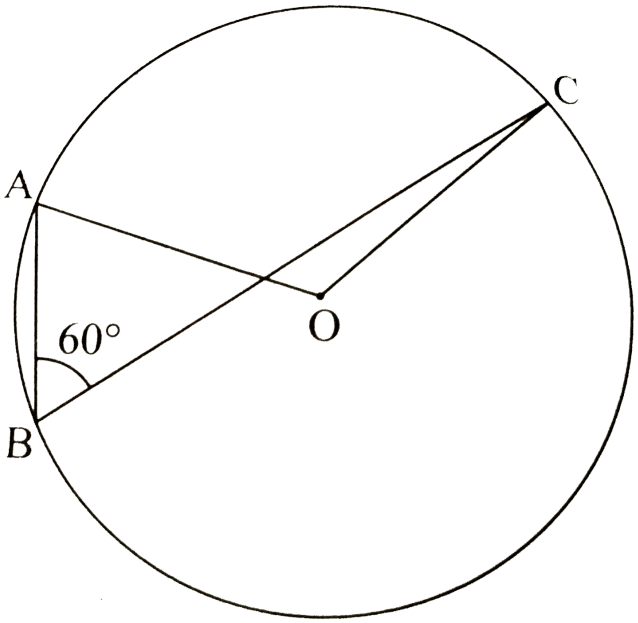
10. In the figure, if $\angle ABC = 60^\circ$, then $\angle AOC =$



A. 120°

B. 60°

C. 30°

D. 90°

Answer: A

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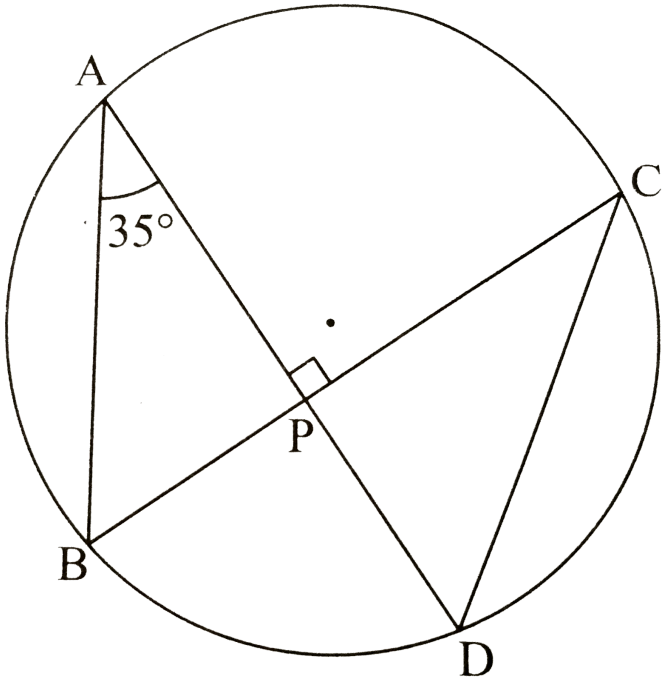
11. In the figure, chords AD and BC intersect each other at right angles at a point P. If $\angle DAB = 35^\circ$, then $\angle ADC =$



A. 35°

B. 55°

C. 65°

D. 45°

Answer: B

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12. PQRS is a cyclic uadrilateral such that PR is the diameter of the circle. If $\angle QPR = 50^\circ$ and $\angle SPR = 60^\circ$, then $\angle QRS = \ldots\ldots$

A. 50°

B. 60°

C. 110°

D. 70°

Answer: D

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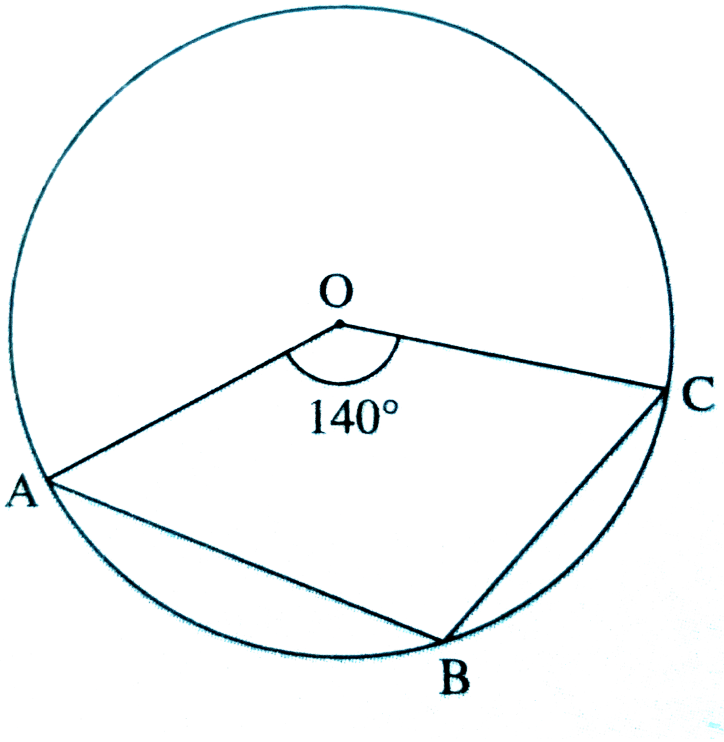
13. In the figure, O is the centre of the circle such that $\angle AOC - 140^\circ$, then $\angle ABC = \ldots\ldots$



A. 140°

B. 110°

C. 70°

D. 90°

Answer: B

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14. If P,Q,R are three points which lie on the circle with centre O such that $\angle POQ = 110^\circ, \angle QOR = 130^\circ,$ then $\angle PQR = \ldots\ldots$

A. 110°

B. 130°

C. 60°

D. 120°

Answer: C

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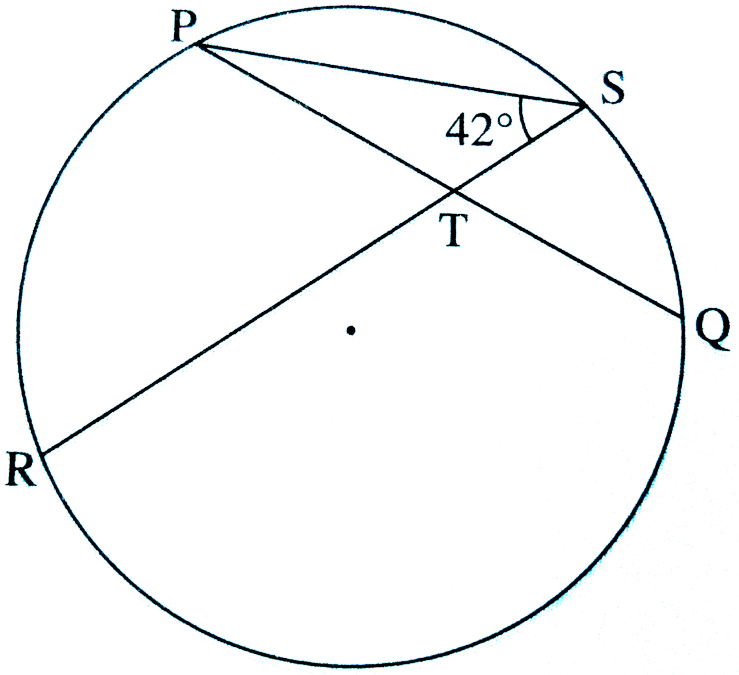
15. In the figure, chords PQ and RS intersect at T as shown. If $\angle PSR = 42^\circ$ and m(arc SQ)=42°, then $\angle STQ = \ldots\ldots$



A. 63°

B. 42°

C. 90°

D. connot be determined

Answer: A

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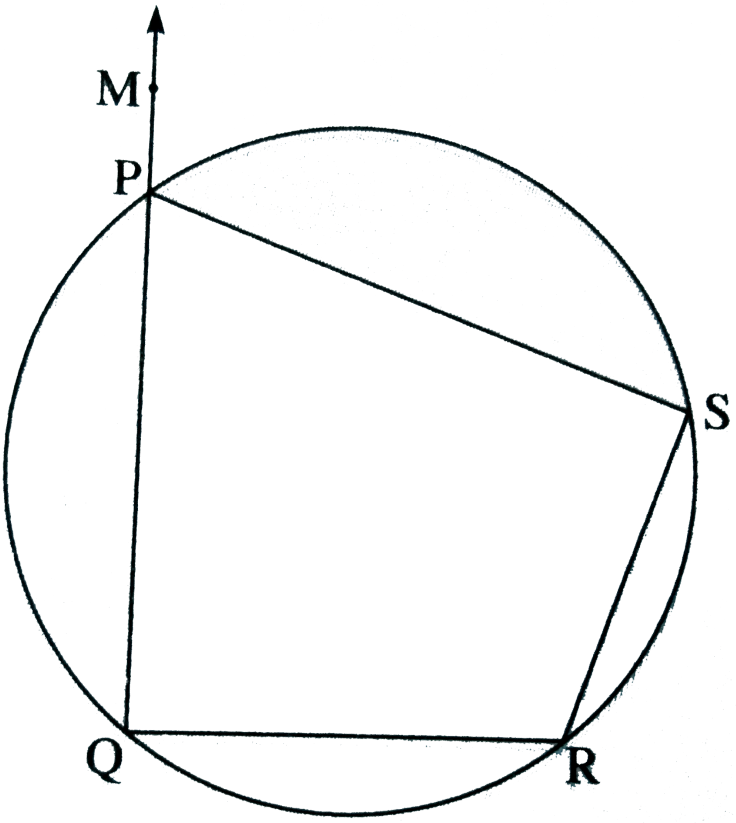
16. In the figure, $\square PQRS$ is cyclic, $\angle SPQ = 7x^\circ$ and $\angle SRQ = 11x^\circ$, then $\angle MPS = \ldots\ldots$



A. 70°

B. 110°

C. 120°

D. 60°

Answer: B

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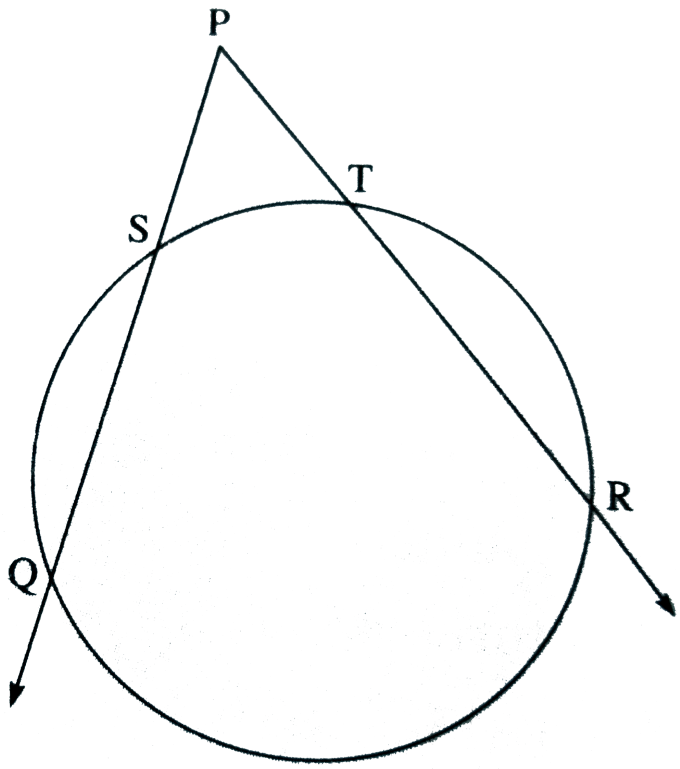
17. In the figure, $\angle QPR$ has its vertex outside the circle such that m(arc QR)=200° and m(arc ST)=90°, then

$\angle QPR = \ldots\ldots\ldots$



A. 45°

B. 100°

C. 110°

D. 55°

Answer: D

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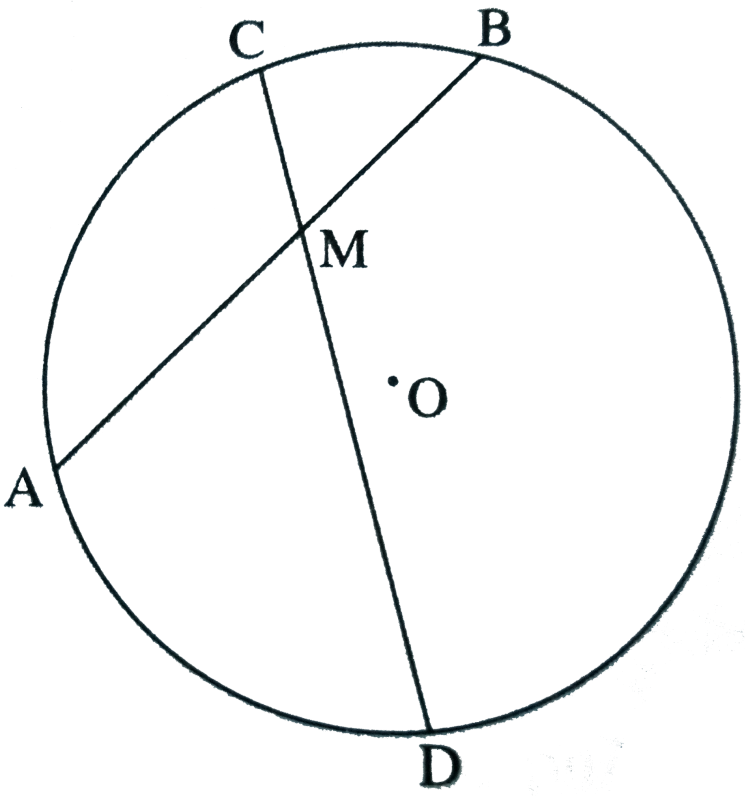
18. In the figure, chord AB and chord CD intersect at point M inside the circle such that AM=4, BM=3, CM=2,

then $CD = \ldots\ldots\ldots$



A. 6

B. 3

C. 7

D. 8

Answer: D

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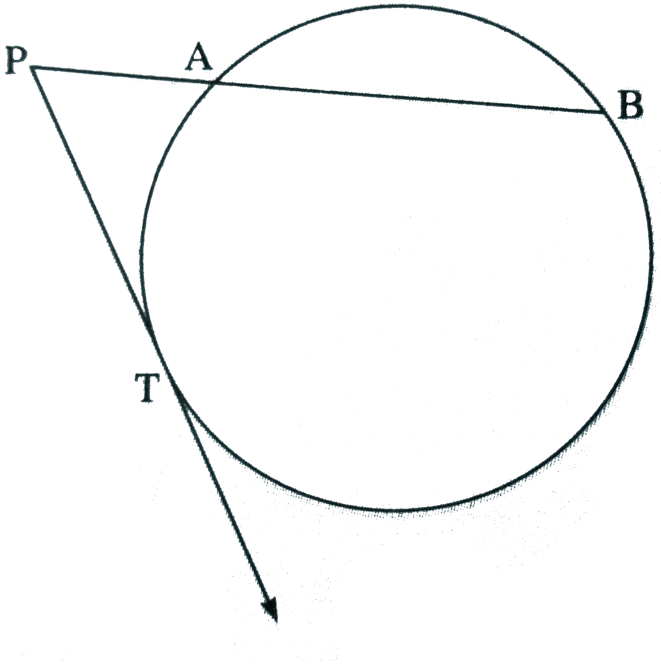
19. In the figure, ray PT touches the circle at point T and line PAB is secent intersecting the circle at points A and B, then



A. $PT = PA \times PB$

B. $PT^2 = \sqrt{PA \times AB}$

C. $PT^2 = PA \times PB$

D. $PT^2 = PA^2 \times PB^2$

Answer: C

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20. Find the length of tangent segment drawn to a circle with radius 5 cm from a point 13 cm from the centre of the circle.

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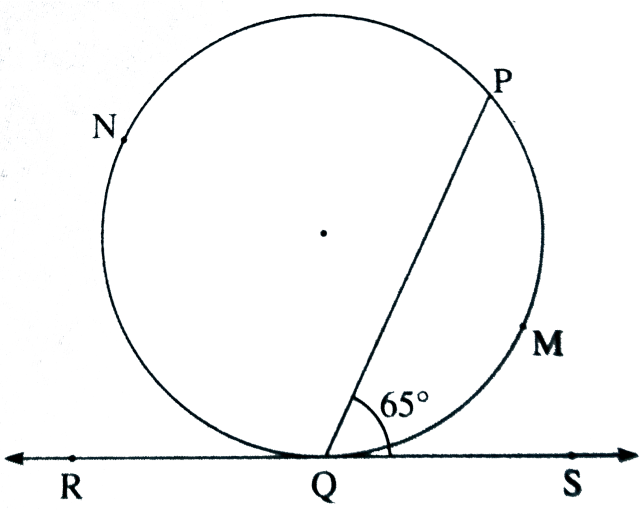
21. In the figure, line RS is tangent at point Q. If $\angle PQS = 65^\circ$ find m(arc PMQ) and m(arc PNQ).



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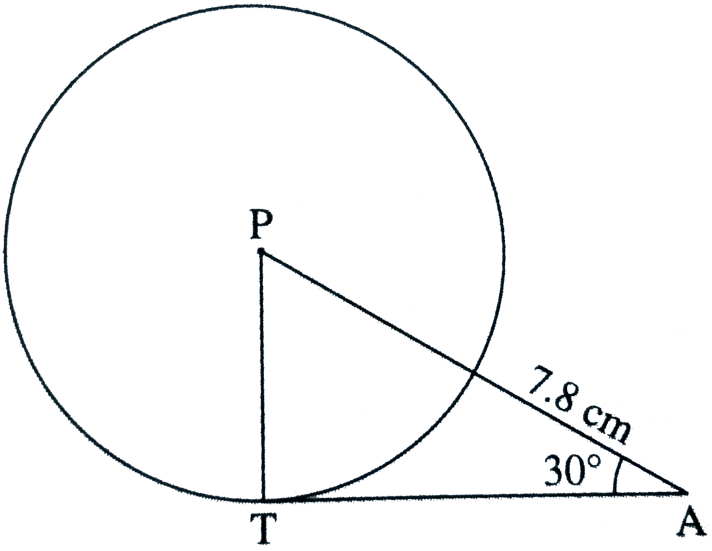
22. In the figure, line TA is tangent at point T, $\angle PAT = 30^\circ$ and PA=7.8 cm then find PT and TA.



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23. Two circles of radius 5 cm and 4 cm touch each other.

Find the distance between their centers.

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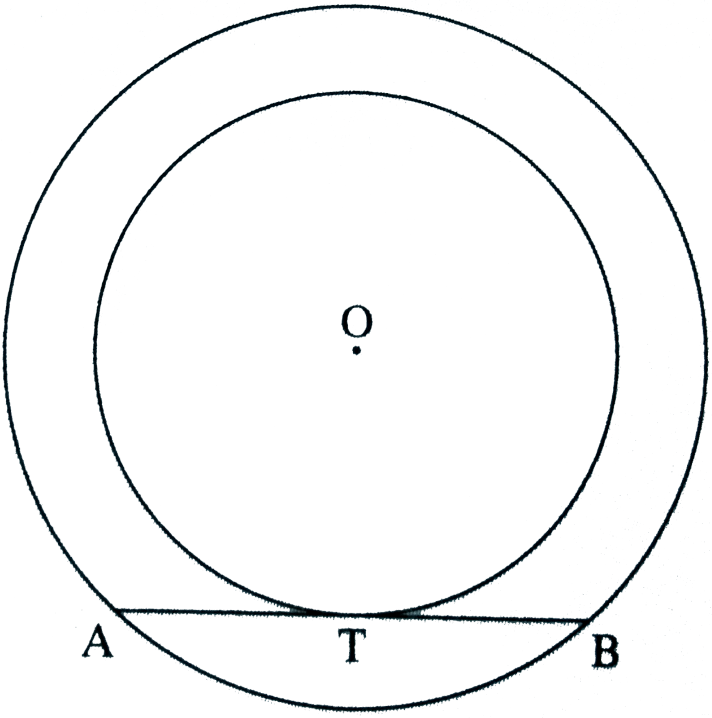
24. In the figure, two concentric circles are given and line AB is tangent to the smaller circle at T. Show that T is the midpoint of seg AB.



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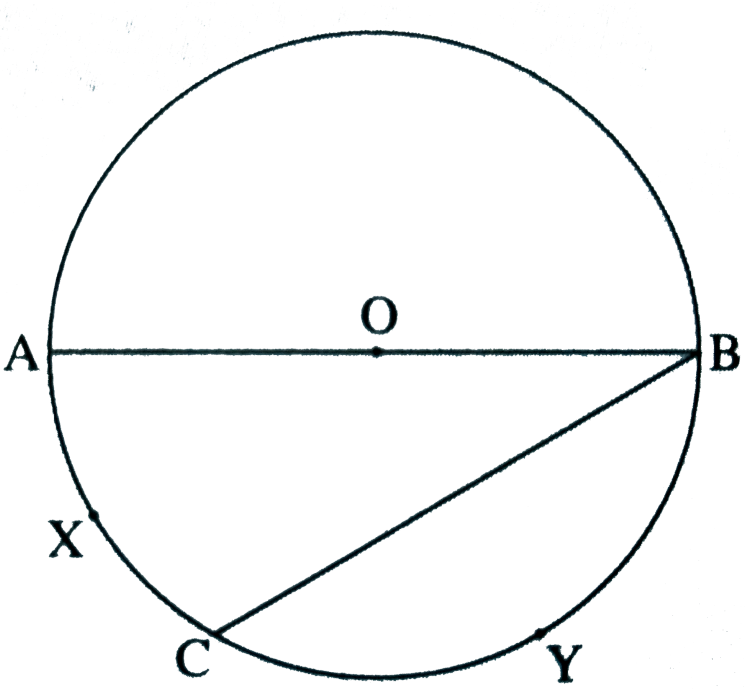
25. In the figure, seg AB is the diameter of the circle, $\angle ABC = 30^\circ$, Find (1) m(arc AXC)

(2) m(arc BYC)



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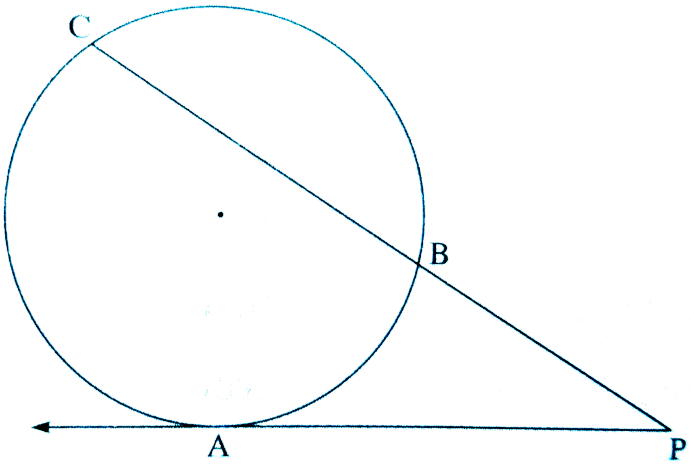
26. In the figure, a tangent segment PA touches the circle at point A and secant PBC intersects the circle at points B and C. If AP=15 cm and BP=10, then find BC.



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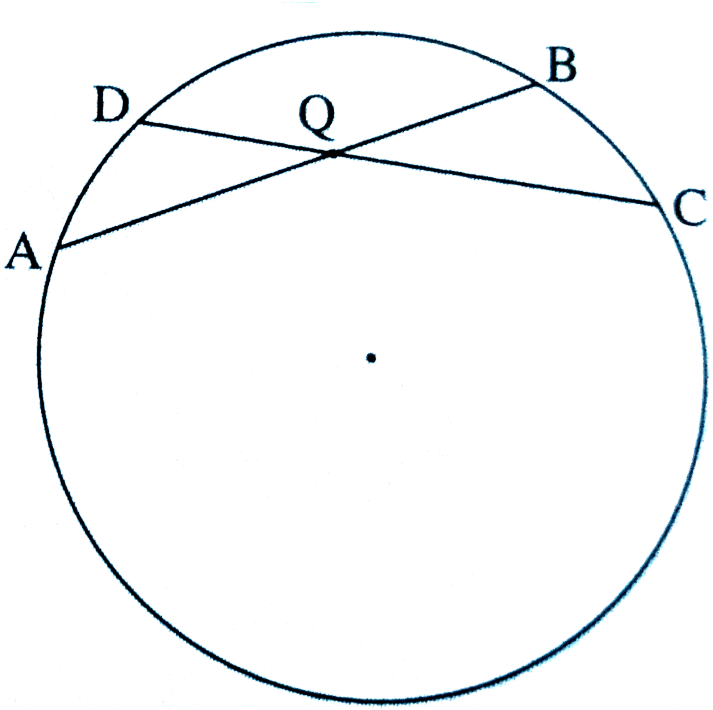
27. Chords AB and CD of a circle intersect in point Q in interior of a circle. If m(arc AD)=25° and m(arc BC)=31°,

find $\angle BQC$.



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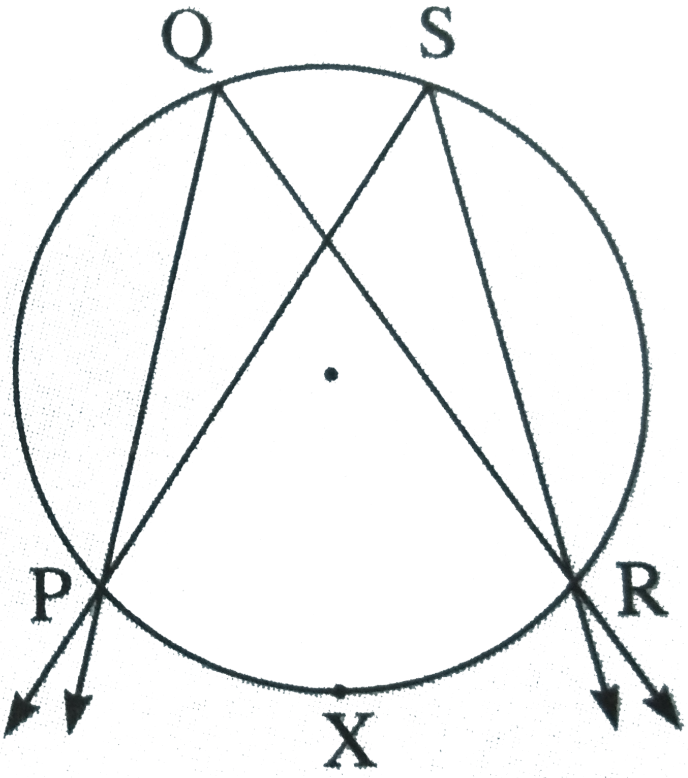
28. Prove that, angles inscribed in the same are arc congruent.



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29. Two circles intersect each other in points A and B. Seg AB is the chord of both the circles . Point C is in the exterior point of both the circles on the line AB. From

the point C tangents are drawn to the circles touching at M and N as shown. Completely the following to prove CM= CN.

Proof :

$CM^2 = CA \times \square$ ....($\square$) ....(1)

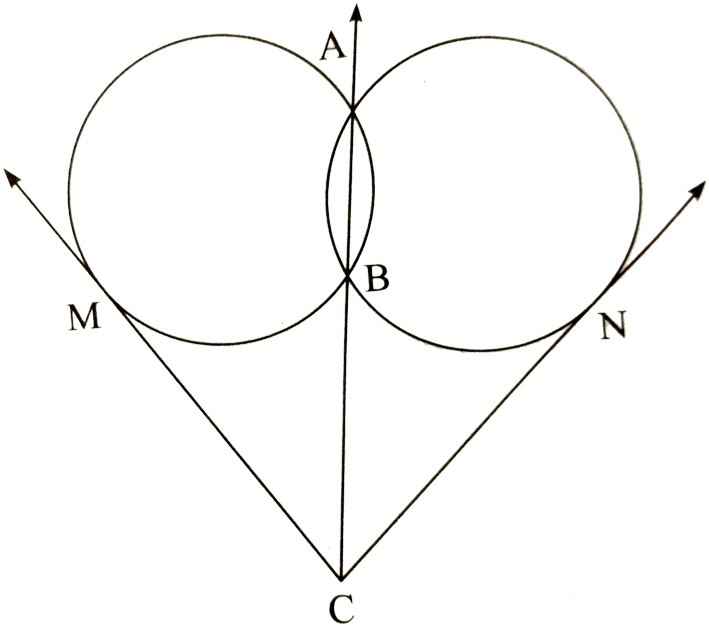
$CN^2 = \square \times CB$ ...(Tangent secant segment property)

....(2)

$\therefore$ From (1) and (2),

$CM^2 = \square$

$\therefore CM = CN$



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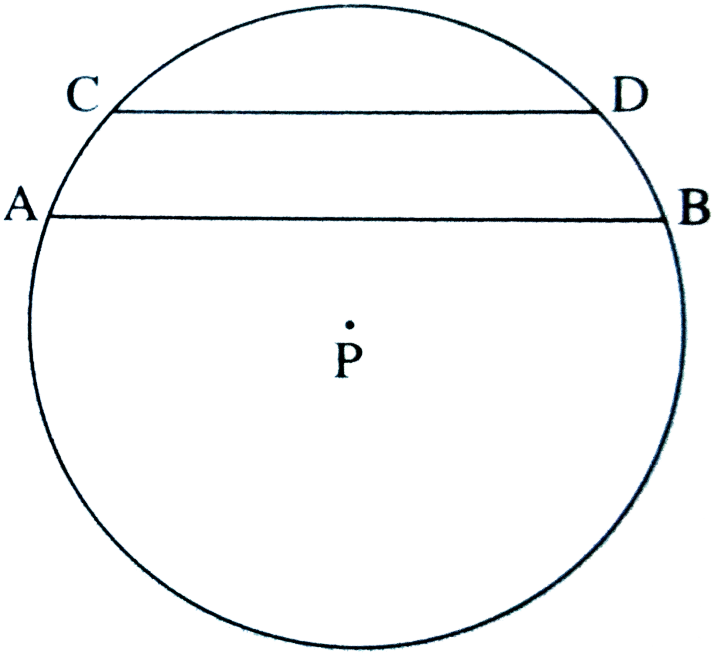
30. In the figure, P is the centre of the circle. Two chords AB and CD are parallel to each other. Prove

$\angle CPA = \angle DPB.$



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31. Three circles touch each other pairwise externally. If the distance between their centres is 5 cm and 7 cm and 6 cm. Find their radii.

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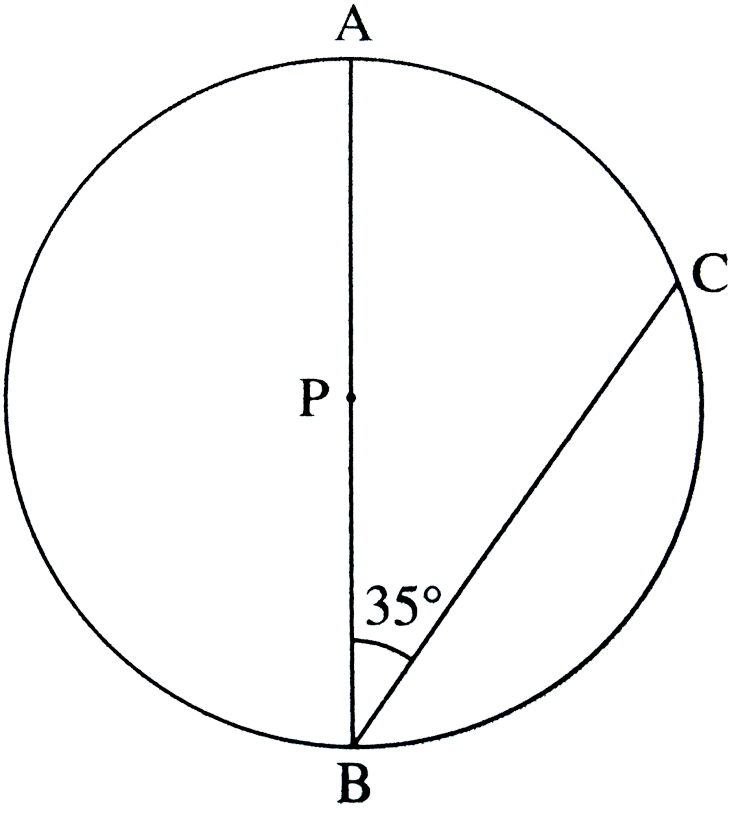
32. In the figure P is the centre and A and B are the endpoints of diameter of circle. C is a point of the circle such that $\angle ABC = 35^\circ$. Determine $\angle BAC, \angle PCB$ and $\angle PCA$.



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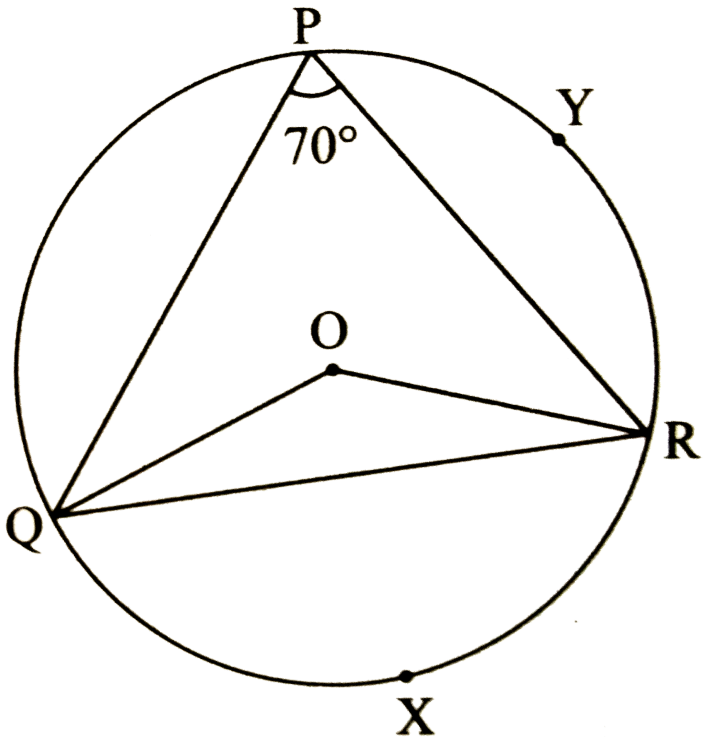
33. In the figure, O is the centre of circle $\angle QPR = 70^\circ$ and m (arc PYR) $= 160^\circ$, then find the value of each of the following :

(a) m (arc QXR)

(b) $\angle QOR$

(c) $\angle PQR$



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34. As per the figure, two circles intersect each other at points P and Q. Point A is on PQ produced and AMD and

ASR are the secants to the circles. If AM = 3, MD = 5, AS = 4, The value of SR is :

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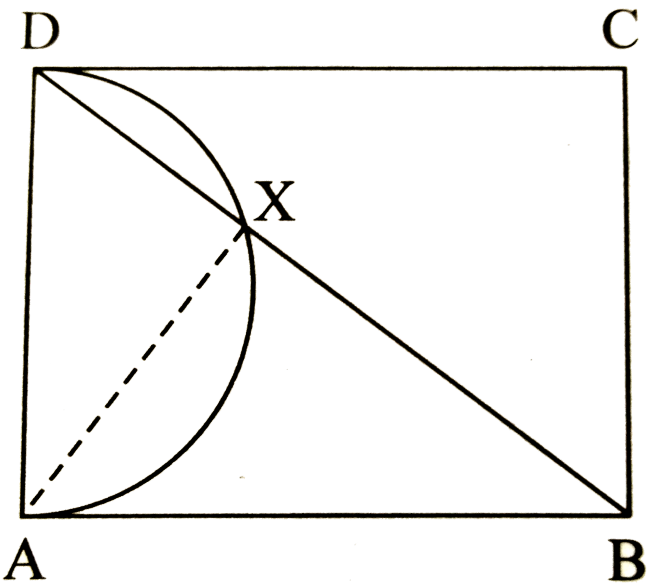
35. $\square ABCD$ is a rectangle. Taking AD as a diameter a semicircle AXD is drawn which intersets diagonal BD at X. If AB = 12 cm , AD == 9 cm , find the values of (i) BD (ii)

BX.



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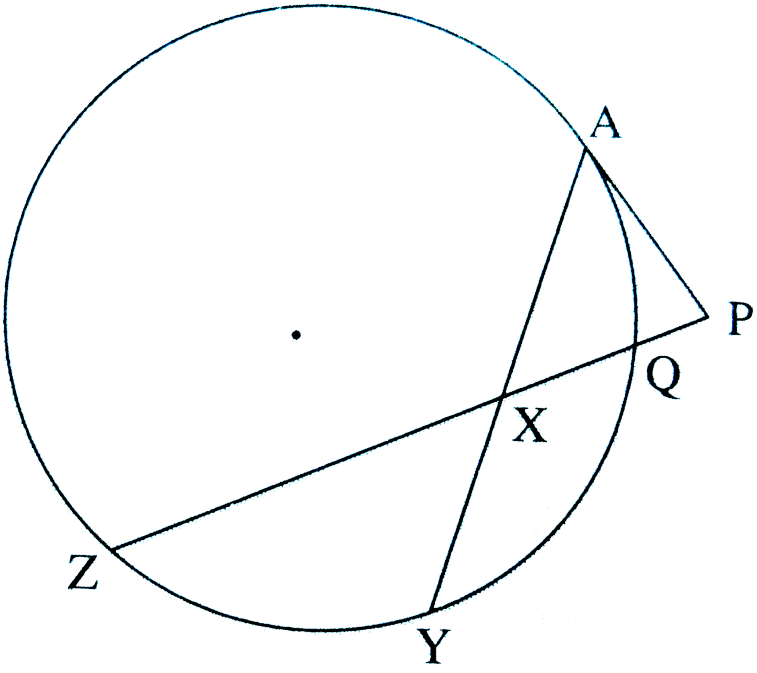
36. As shown in the figure, AP is tangent to the circle at point A. Secant through P intersects chord AY in point X,

such that AP=PX=XY. If PQ = 1, QZ =8. Then find AX



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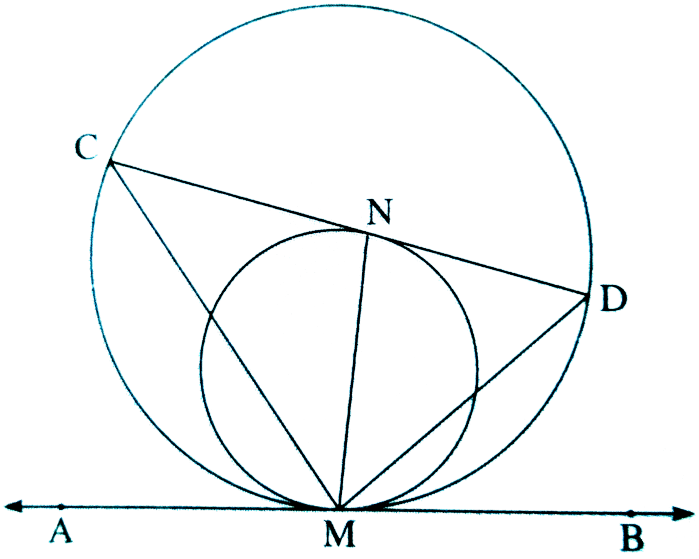
37. In the figure, M is the point of contact of two internally touching circles. The chord CD of the bigger circle touches the smaller circle at point N. Line AMB is

their common tangent. Prove MN bisects $\angle CMD$



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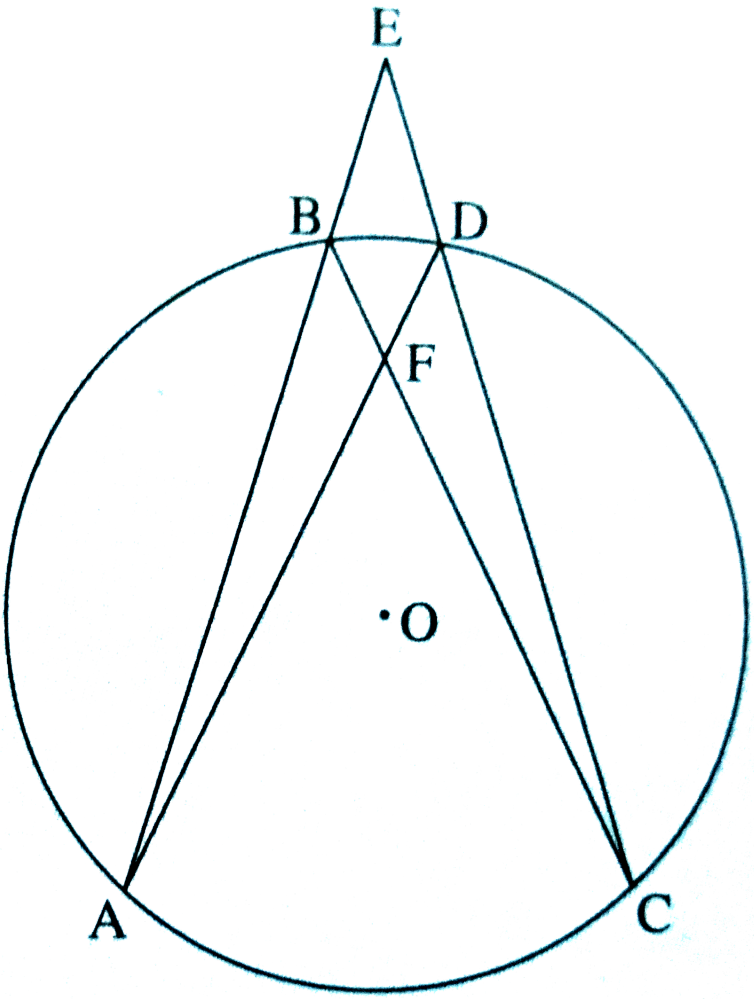
38. In the figure, O is the centre of the circle. Prove $\angle AOC = \angle AFC + \angle AEC.$



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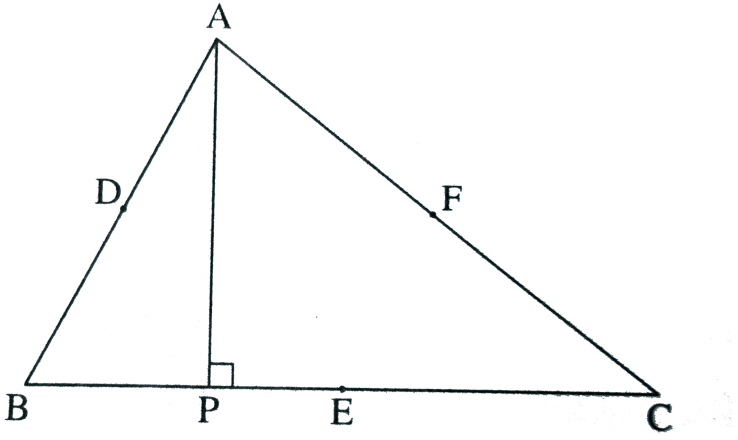
39. In the figure, D E and F are midpoints of sedes AB,BC and AC respectively. P is the foot of the perpendicular from A to side BC. Show that points D, E,F and P are concyclic.



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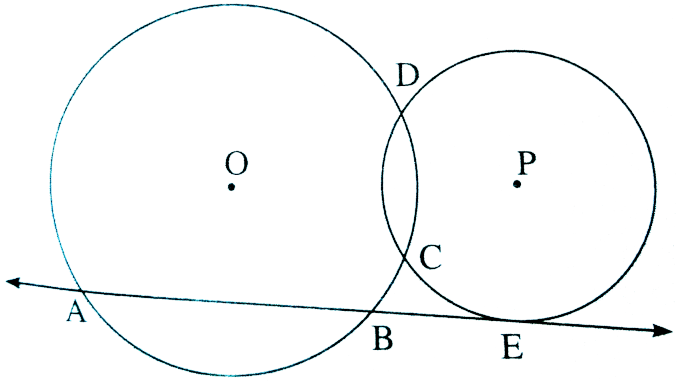
40. In the figure, two circles with centers O and P intersect each other at points D and C. Line AB intersects

the circle with centre O at points A and B and touches the circle with centre P at point E. Prove $\angle ADE + \angle BCE = 180^\circ$.



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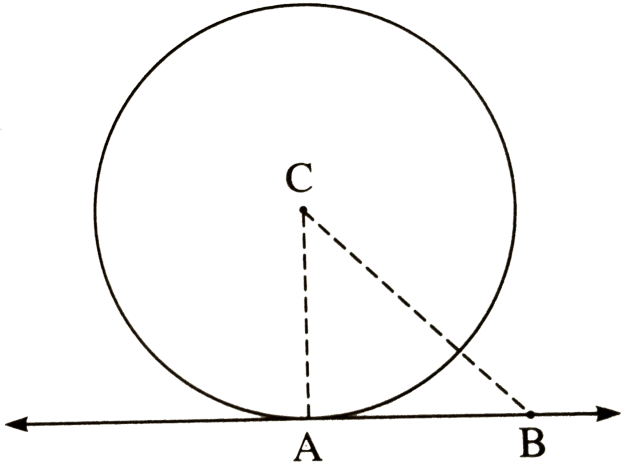
PRACTICE SET 3.1

1. In the figure, the radius of a circle with centre C is 6 cm, line AB is a tangent at A. Answer the following

questions.

What is the measure of $\angle CAB$? Why?.



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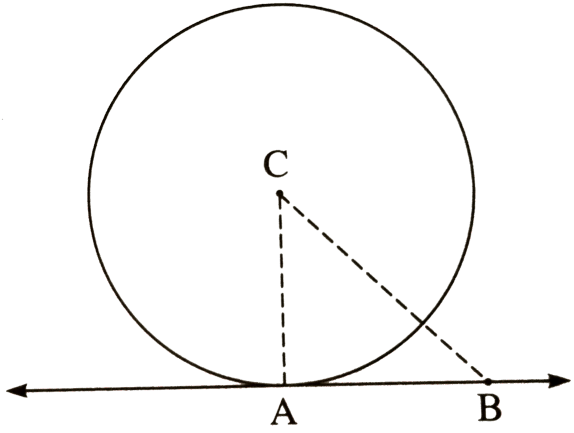
2. In the figure, the radius of a circle with centre C is 6 cm, line AB is a tangent at A. Answer the following questions.

What is the distance of point C from line AB? Why?



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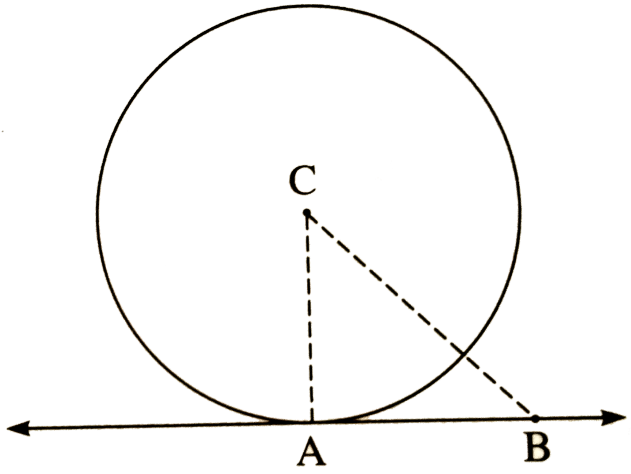
3. In the figure, the radius of a circle with centre C is 6 cm, line AB is a tangent at A. Answer the following questions.

d(A,B)=6cm, find d(B,C).



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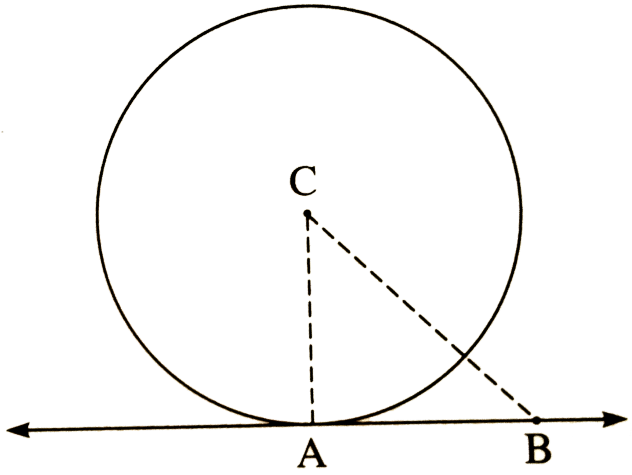
4. In the figure, the radius of a circle with centre C is 6 cm, line AB is a tangent at A and AB is 6 cm. Answer the following questions.

What is the measure of $\angle ABC$? Why?.



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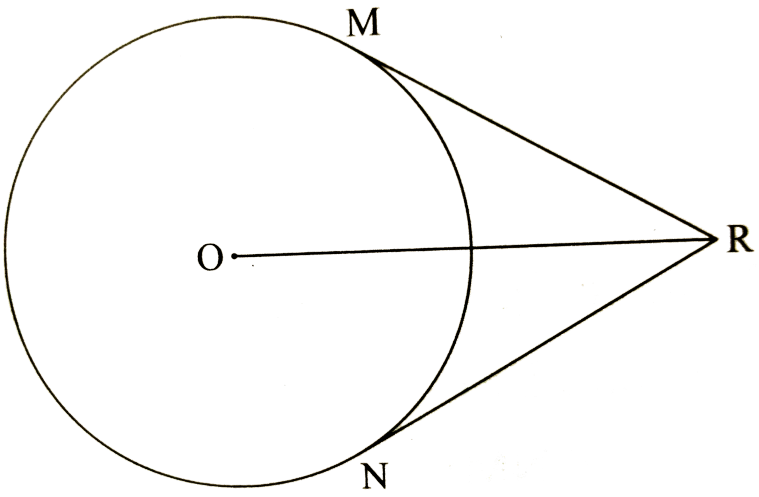
5. In the figure , O is the same of the circle. From point R, seg RM and seg RN are tangent segments touching the circle at M and N. If OR = 10cm and radius of the circle = 5 cm, then

(i) What is the length of each tangnet segment ?

(iii) What si the measure of $\angle MRO$?

(iii) Whatis the measure of $\angle MRN$?



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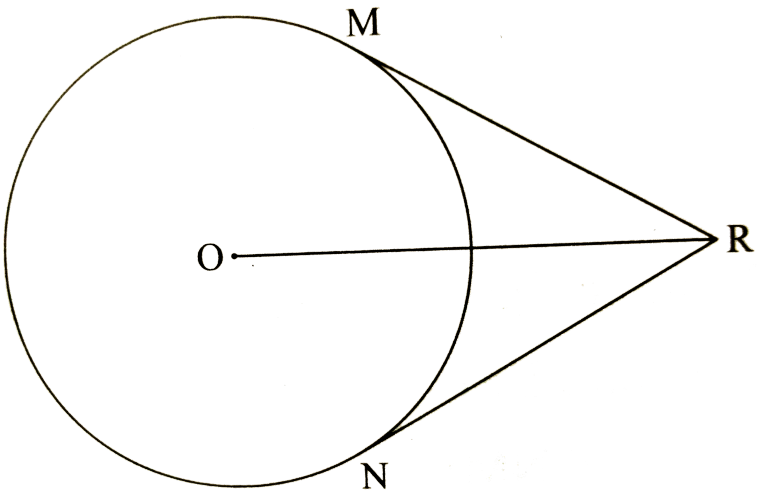
6. In the figure , O is the same of the circle. From point R, seg RM and seg RN are tangent segments touching the circle at M and N. If OR = 10cm and radius of the circle = 5 cm, then

(i) What is the length of each tangnet segment ?

(iii) What si the measure of $\angle MRO$?

(iii) Whatis the measure of $\angle MRN$?



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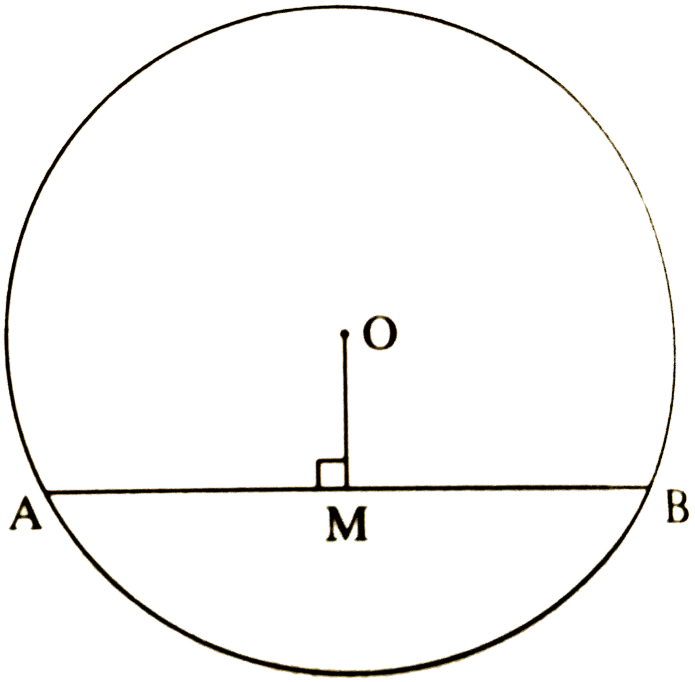
7. In the figure , seg AB is the chord of the circle with centre O. if AM =4 cm then find MB and AB. State your

reason.



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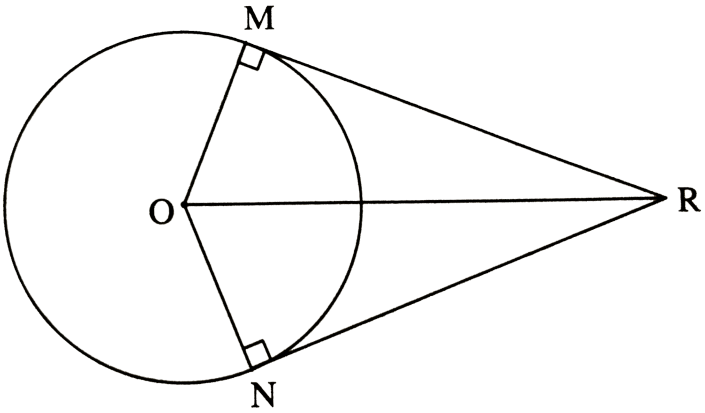
8. Seg RM and seg RN are tangent segments of a circle with centre O. Prove that seg OR bisects $\angle MRN$ as well

as $\angle MON$.



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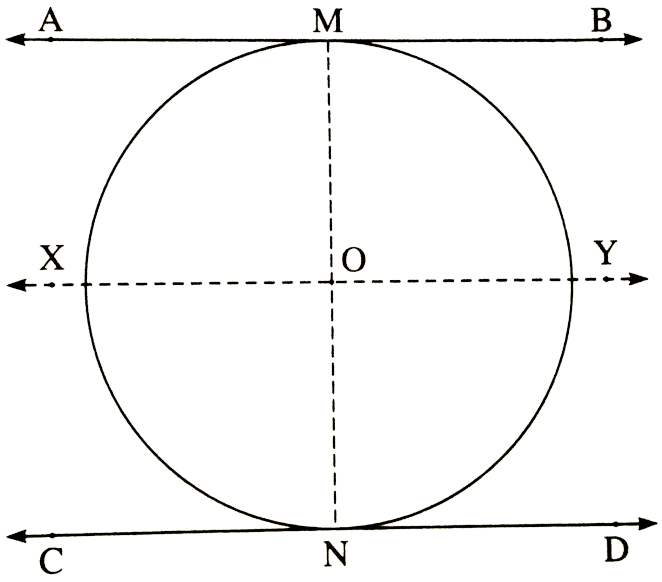
9. What is the distance between two parallel tangents of a circle having radius 4.5 cm ?. Justify your answer.



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PRACTICE SET 3.2

1. Two circles having radii 3.5 cm and 4.8 cm touch each other internally. Find the distance between thir centres.

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2. Two circles of radii 5.5 cm and 4.2 cm touch each other externally. Find the distance between thir centres.

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3. If radii of two circles are 4 cm and 2.8 cm. Draw figure of these circles touching each other.

Externally.

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4. If radii of two circles are 4 cm and 2.8 cm. Draw figure of these circles touching each other.

Internally.

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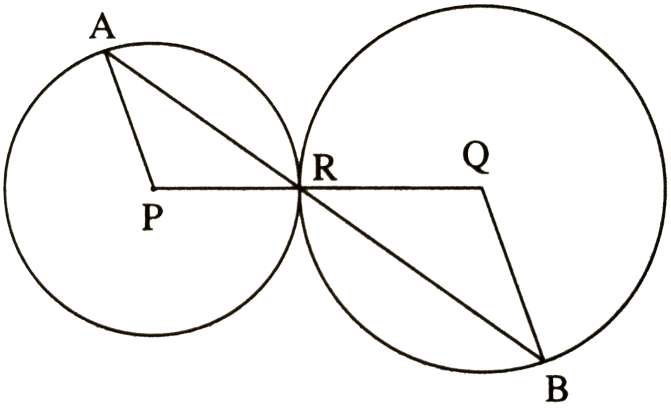
5. In the figure, the circles with centers P and Q touch each other at R.A line passing through R meets the circles at A and B respectively. Prove that

seg AP || seg BQ



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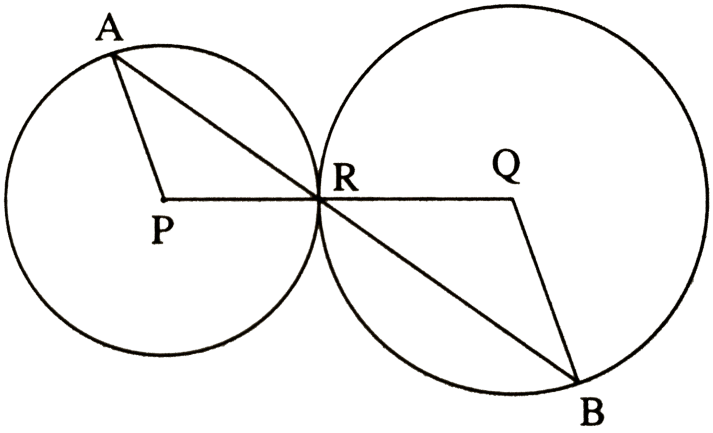
6. In the figure, the circles with centers P and Q touch each other at R.A line passing through R meets the circles at A and B respectively. Prove that

$\triangle APR \sim \triangle RQB$



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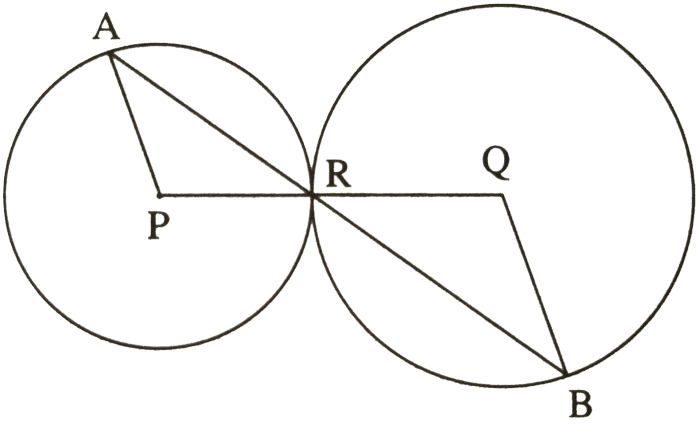
7. In the figure, the circles with centers P and Q touch each other at R.A line passing through R meets the circles at A and B respectively.

Find $\angle RQB$ if $\angle PAR = 35^\circ$



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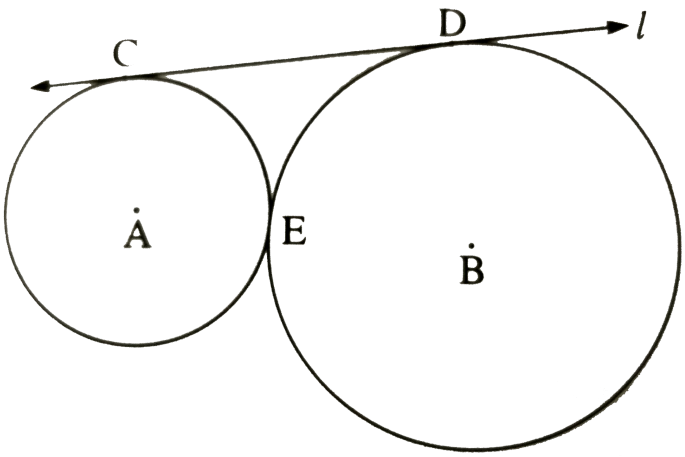
8. In the figure, the circles with centeres A and B touch each other at E. Line l is a common tangent which

touches the circles at C and D respectively. Find the length of seg CD, if the radii of the circle are 4 cm, 6 cm.



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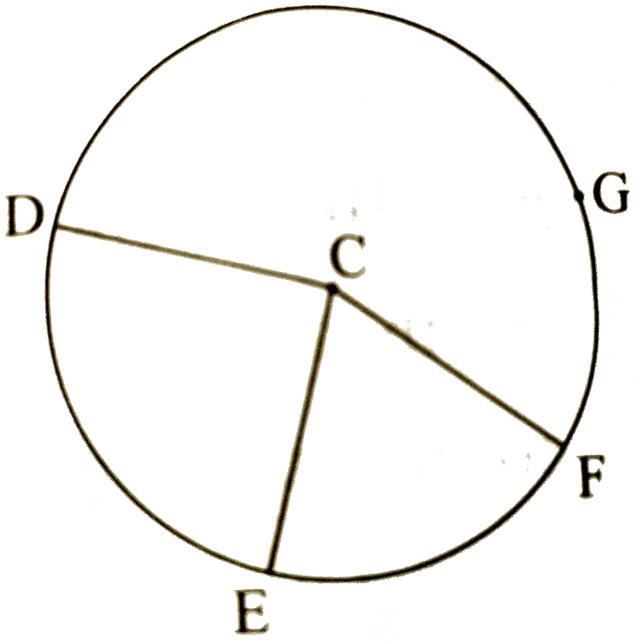
PRACTICE SET 3.3

1. In the figure , points G,D,E,F are concyclic points of a cicle with centreC.

$\angle ECF = 70^\circ$

m (arc DGF) $= 200^\circ$,

find m(arc DE) and m(arc DEF) .



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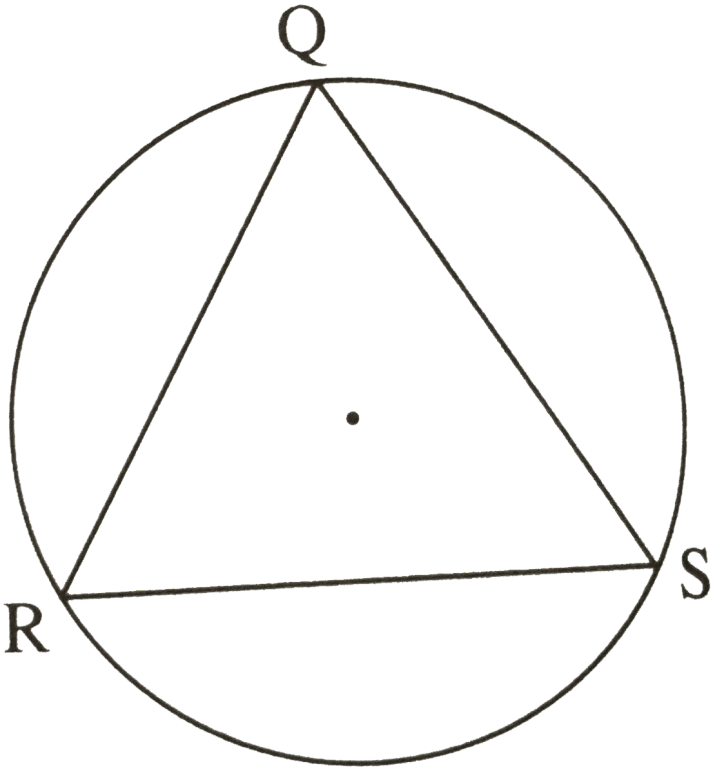
2. In figure, $\triangle QRS$ is an equilateral triangles. Prove that,

(1) $arcRS \cong arcQS \cong arcQR$

(2) $m(arcQRS) = 240^\circ$.



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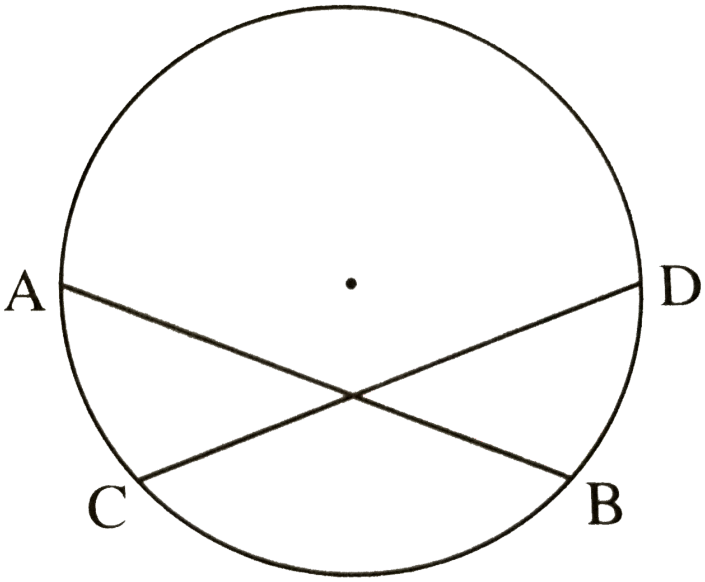
3. In figure, chord AB $\cong$ chord CD, Prove that, arc AC $\cong$ arc BD.



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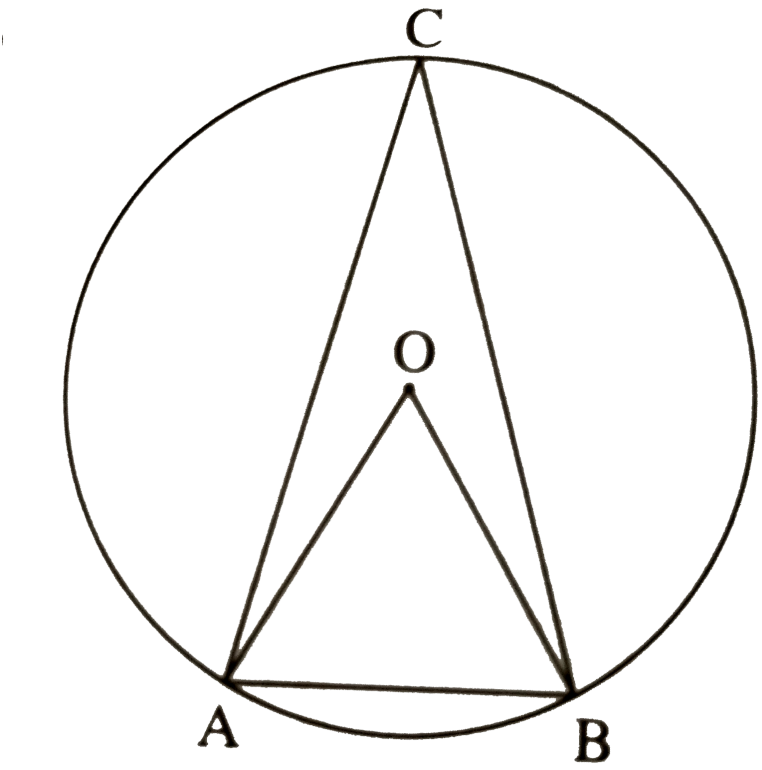
PRACTICE SET 3.4

1. In the figure, in a circle with centre O, length of chord AB is equal to the radius of the circle. Find measure of each of the following.

$\angle AOB$



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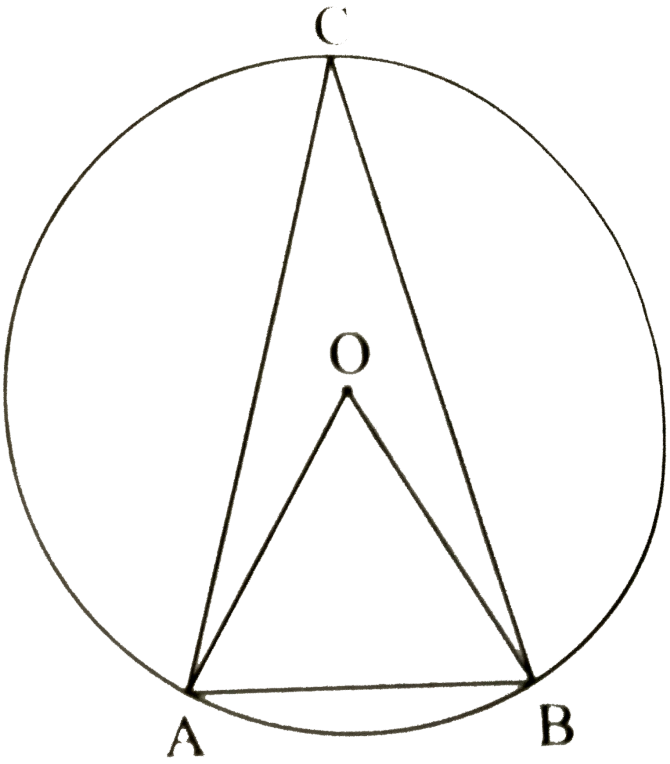
2. In the figure , in a circle with centre O, length of chord AB is equal to the radius of the circle. Find the measure of each of the following :

(1) $\angle AOB$

(2) $\angle ACB$

(3) arc AB

(4) arc ACB



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3. In the figure , in a circle with centre O, length of chord AB is equal to the radius of the circle. Find the measure

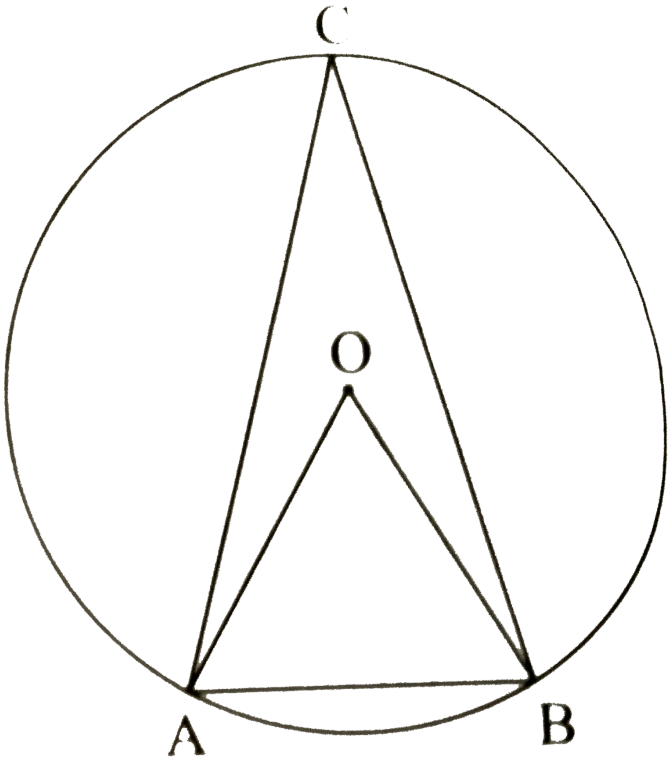
of each of the following :

(1) $\angle AOB$

(2) $\angle ACB$

(3) arc AB

(4) arc ACB



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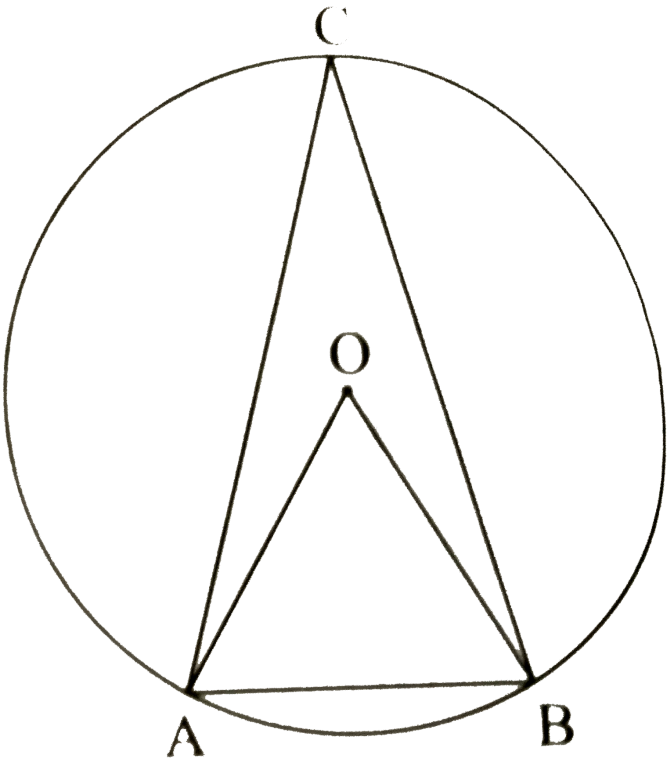
4. In the figure , in a circle with centre O, length of chord AB is equal to the radius of the circle. Find the measure of each of the following :

(1) $\angle AOB$

(2) $\angle ACB$

(3) arc AB

(4) arc ACB



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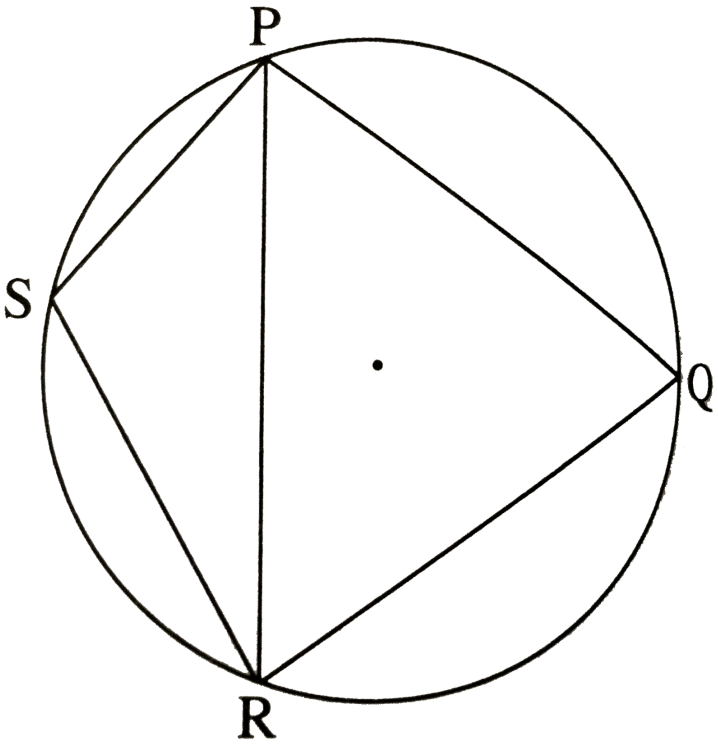
5. In the figure, $\square PQRS$ is cyclic side PQ $\cong$ RQ, $\angle PSR = 110^\circ$, Find

$\angle PQR$



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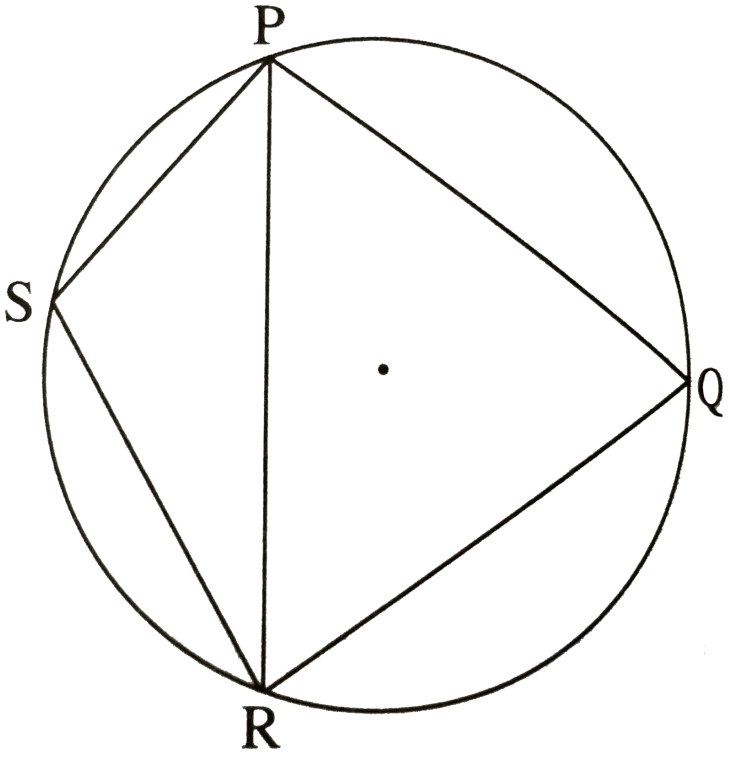
6. In the figure, $\square PQRS$ is cyclic side PQ $\cong$ RQ, $\angle PSR = 110^\circ$, Find

m(arc PQR)



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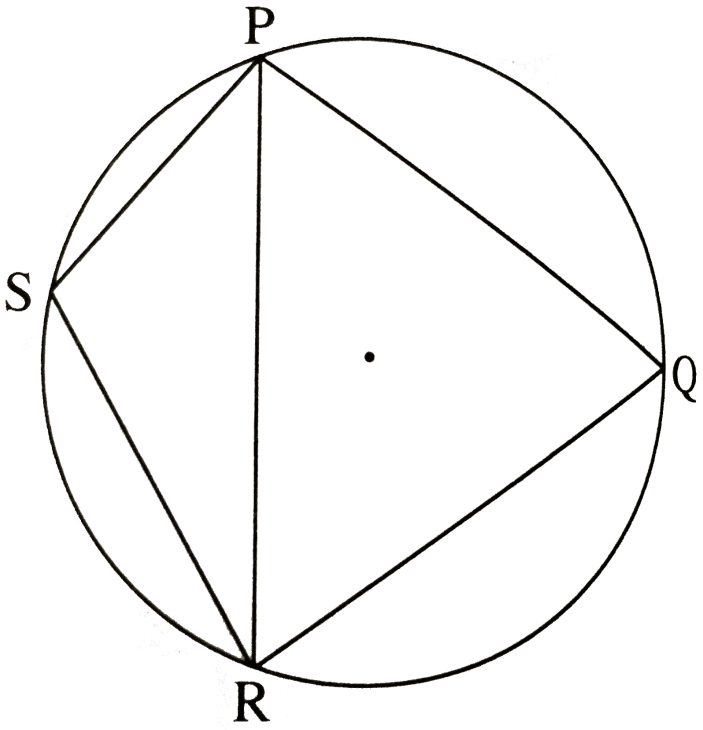
7. In the figure, $\square PQRS$ is cyclic side PQ $\cong$ RQ, $\angle PSR = 110^\circ$, Find

m(arc QR)



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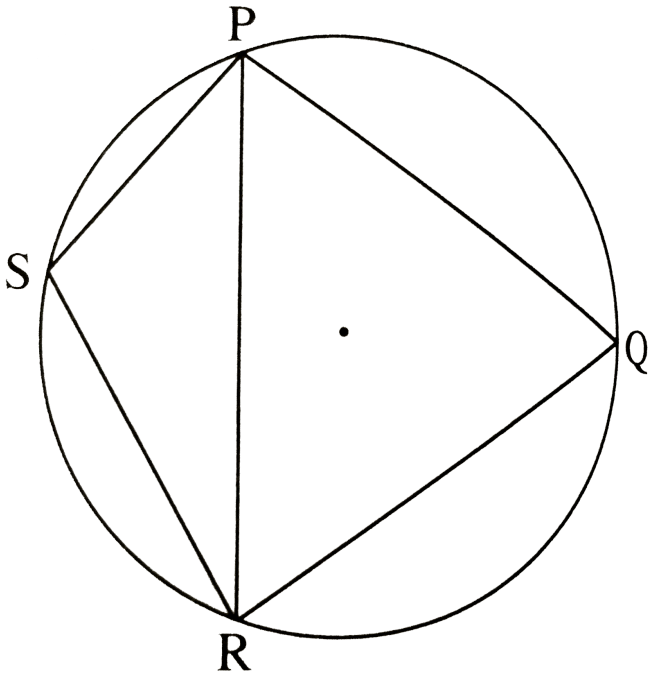
8. In the figure, $\square PQRS$ is cyclic side PQ $\cong$ RQ, $\angle PSR = 110^\circ$, Find

measure of $\angle PRQ$



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9. $\square MRPN$ is cyclic , $\angle R = (5x - 13)^\circ, \angle N = (4x + 4)^\circ$.Find measures of $\angle R$ and $\angle N$.

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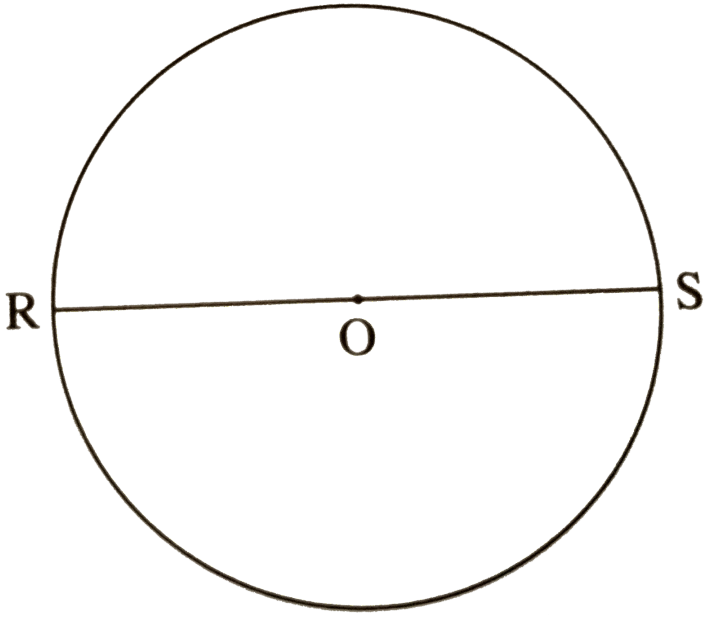
10. In figure, seg RS is a diameter of the circle with centre O. Point T lines in the exterior of the circle. Prove that $\angle RTS$ is an acute angle.



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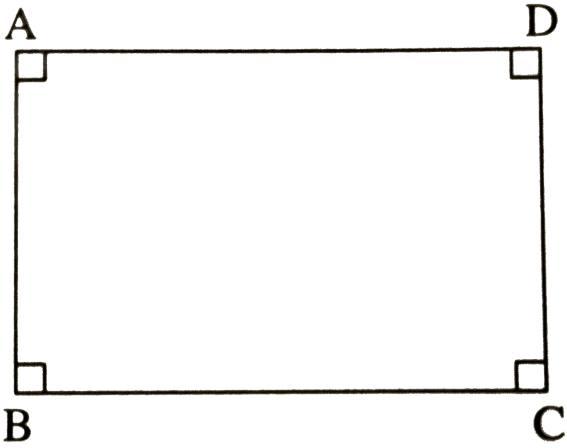
11. Prove that, any rectangle is a cyclic quadrilateral.



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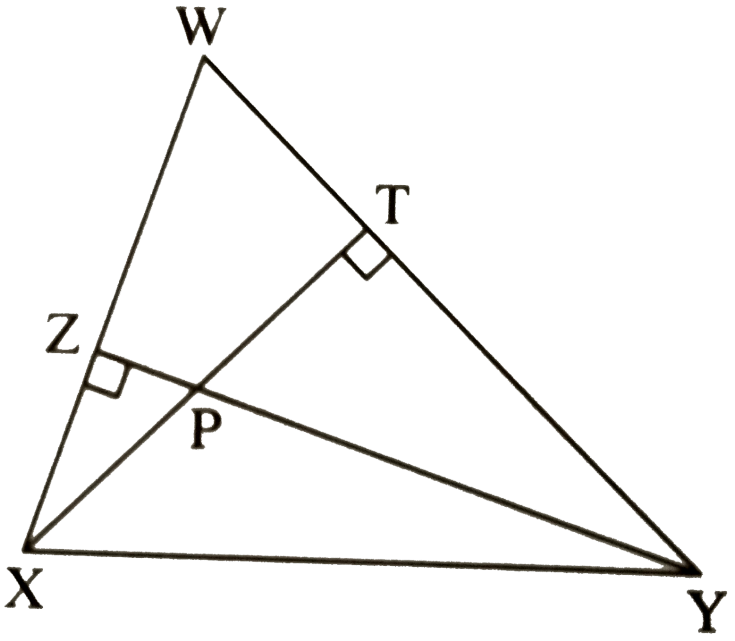
12. In figure, altitudes YZ and XT of $\triangle WXY$ intersect at P. Prove that

$\square WZPT$ is cyclic



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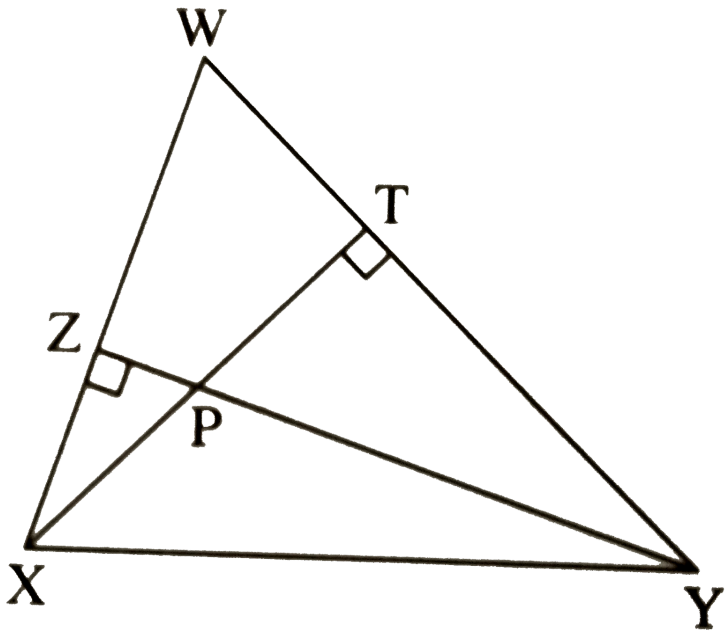
13. In figure, altitudes YZ and XT of $\triangle WXY$ intersect at P. Prove that

Points X,Z,T,Y are concyclic.



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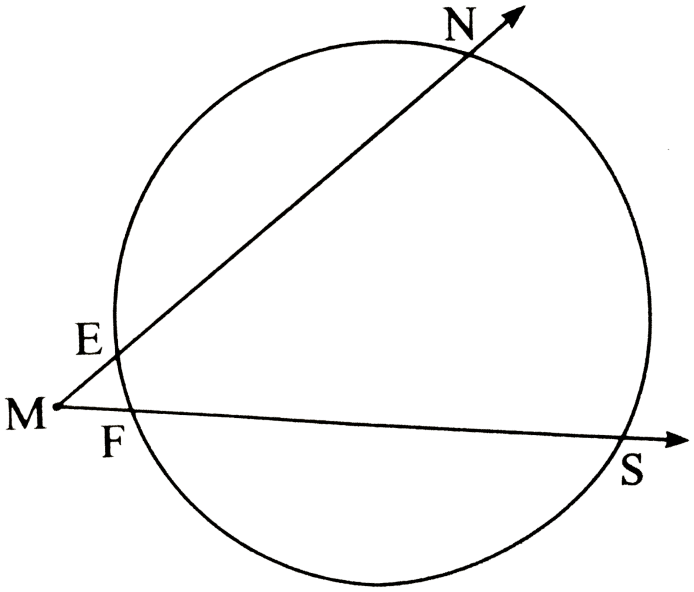
14. In the figure,

m) arc NS) $= 125^\circ$

m (arc EF) = 37°

find the measure $\angle NMS$,



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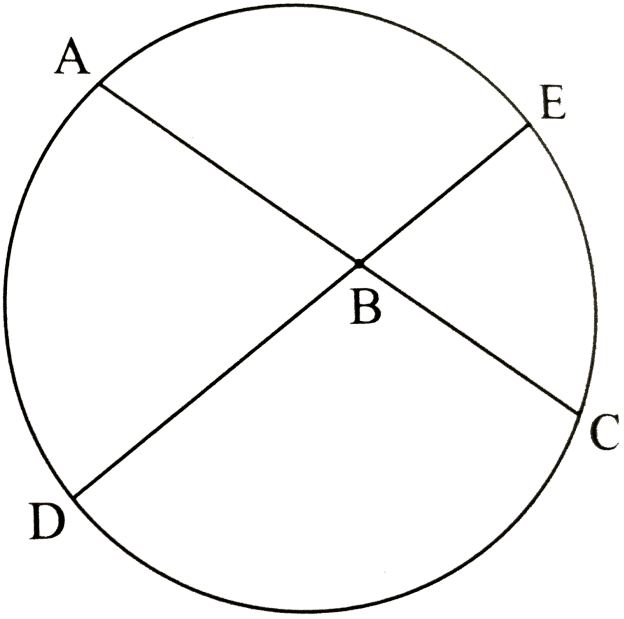
15. In the figure, chords AC and DE intersect at B. If $\angle ABE = 108^\circ$, m (arc AE) $= 95^\circ$, find m (arc DC).



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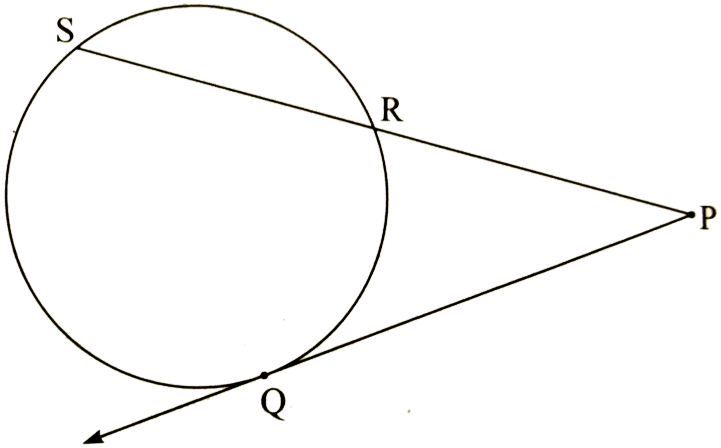
PRACTICE SET 3.5

1. In the figure, ray PQ touches the circle at point Q. If PQ =12, PR = 8, then find PS.



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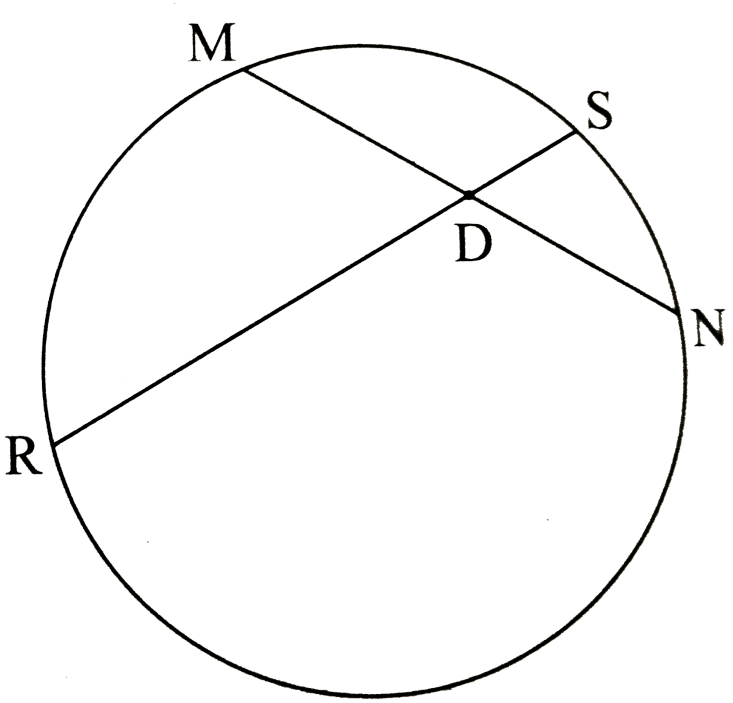
2. In the figure, chord MN and chord RS intersect at point D.

(1) If RD = 15, DS = 4, MD = 8 , find DN.

92) If RS = 18, MD = 9 , DN = 8 , find DS .



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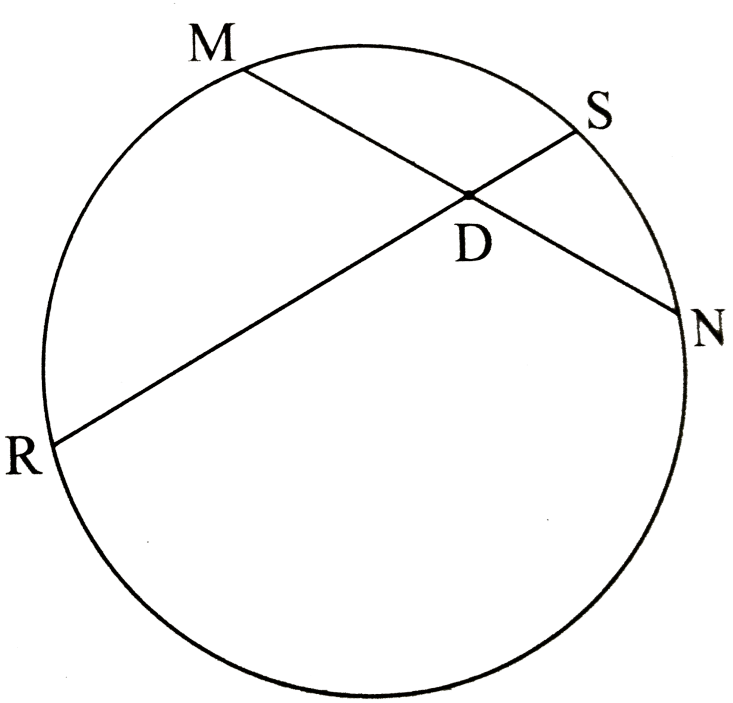
3. In the figure, chord MN and chord RS intersect at point D.

(1) If RD = 15, DS = 4, MD = 8 , find DN.

92) If RS = 18, MD = 9 , DN = 8 , find DS .



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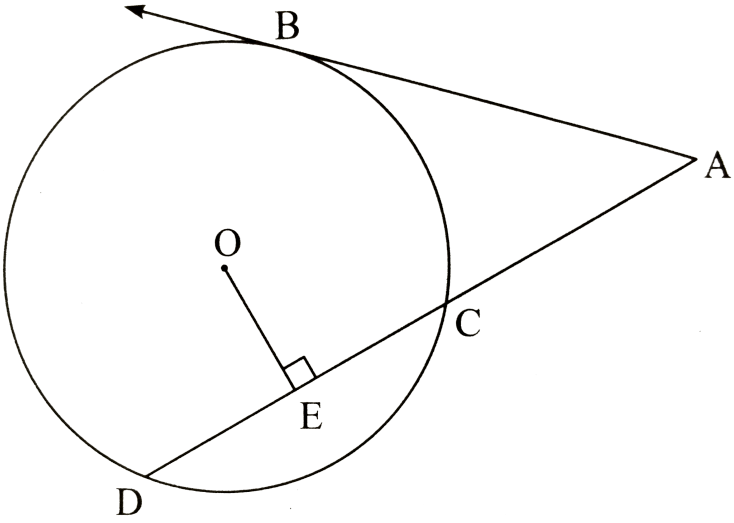
4. In the figure, O is the centre of the circle and B is a point of contact. Seg OE $\perp$ seg AD, AB = 12, AC = 8, find

(i) AD (ii) DC (iii) DE.



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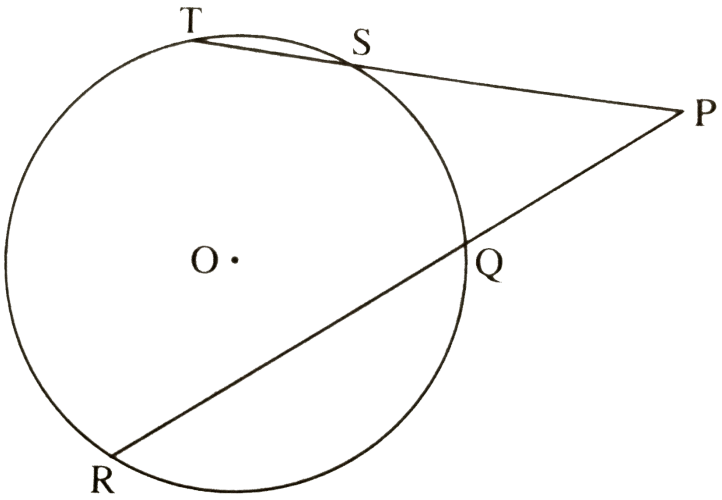
5. In figure, if PQ=6,QR=10,PS=8, find TS.



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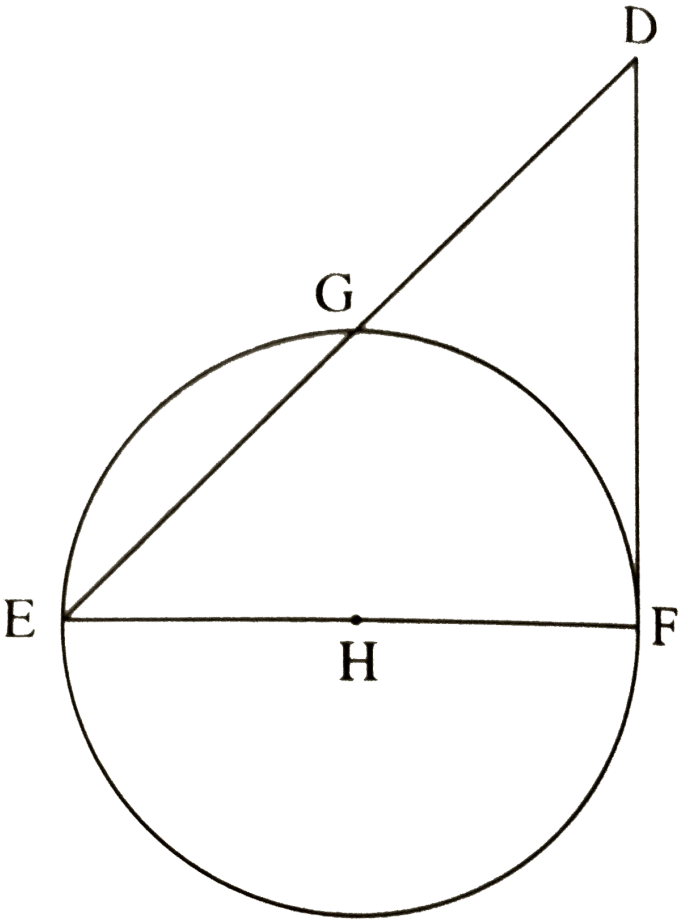
6. In figure, seg EF is a diameter and seg DF is a tangent segment. The radius of the circle is r. Prove that,

$DE \times GE = 4r^2$.



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PROBLEM SET 3

1. Two circles of radii 5.5 cm and 3.3 cm respectively touch each other. What is the distance between their centre ?

A. 4.4 cm

B. 8.8 cm

C. 2.2 cm

D. 8.8 or 2.2 cm

Answer: D

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2. Two circle intersect each other such that each circle passes through the centre of the other. If the distance between their centres is 12 , what is the radius of each circle?

A. 6 cm

B. 12 cm

C. 24 cm

D. connot say

Answer: B

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3. A circle touches all sides of a parallelogram. So the parallelogram must be a

A. rectangle

B. rhombus

C. square

D. trapezium

Answer: B

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4. Length of a tangent segment drawn from a point which is at a distnace 12.5 cm from the centre of a circle

is 12cm , find the diameter of the circle.

A. 25 cm

B. 24 cm

C. 7 cm

D. 14 cm

Answer: C

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5. If two circles touch externally , how many common tangents can be drawn to them ?

A. One

B. Two

C. Three

D. Four

Answer: C

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6. $\angle ACB$ is inscribed in arc ACB of a circle with centre O . If $\angle ACB = 65^\circ$, find m (arc ACB) .

A. $\angle 65^\circ$

B. $\angle 130^\circ$

C. $\angle 295^\circ$

D. $\angle 230^\circ$

Answer: D

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7. Chords AB and CD of a circle interset inside the circle at point E. If AE = 5.6 , EB = 10 cm , CE = 8 ,find ED.

A. 7

B. 8

C. 11.2

D. 9

Answer: A

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8. In a cyclic $\square$ ABCD, twice the measure of $\angle A$ is thrice the measure of $\angle C$. Find the measure of $\angle C$.

A. $\angle 36^\circ$

B. $\angle 72^\circ$

C. $\angle 90^\circ$

D. $\angle 108^\circ$

Answer: B

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9. Points A,B,C are on a circle, such that m(arc AB) = m (arc BC) $= 120^\circ$. No point, except point B, is common to the arcs. What type is the ΔABC?

A. Equilateral triangle

B. Scalene triangle

C. Right angled triangle

D. Isoseles triangle

Answer: A

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10. Seg XZ is a diameter of a circle. Point Y lies in its interor. How many of the followint statements are true?

(1) It is a not possible that $\angle XYZ$ is an acute angle.

(2) $\angle XYZ$ can't be a right angle

(3) $\angle XYZ$ is an obtuse angle.

(4) Can't make a dfinite statement for measure of $\angle XYZ$

A. Only one

B. Only two

C. Only three

D. All

Answer: C

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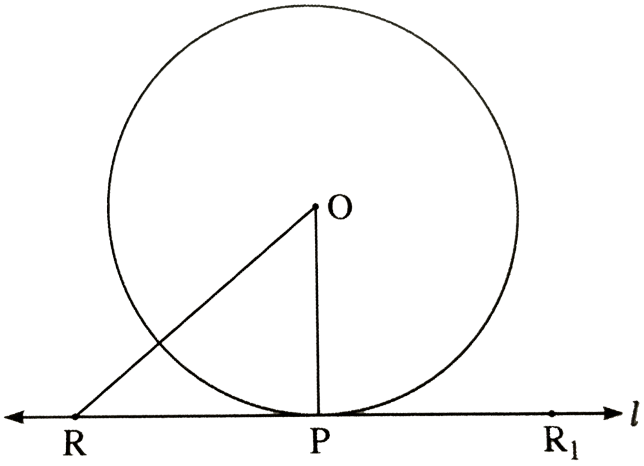
11. Line l touches a circle with centre O at point P. If radius of the circle is 9 cm, answer the following:

What is d(O,P)=? Why?



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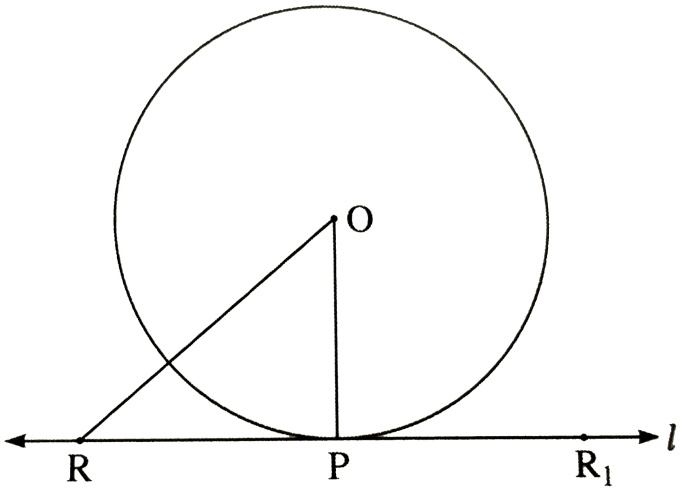
12. Line l touches a circle with centre O at point P. If radius of the circle is 9 cm, answer the following:

If d(O,Q)=8 cm, where does the point Q lie?



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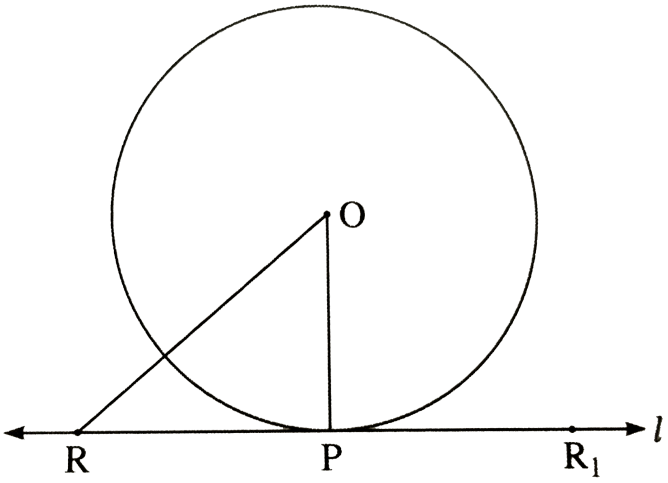
13. Line l touches a circle with centre O at point P. If radius of the circle is 9 cm, answer the following:

If d(O,R)=15 cm, how many locations of point R are line on l? At what distance will each of them be from point P?



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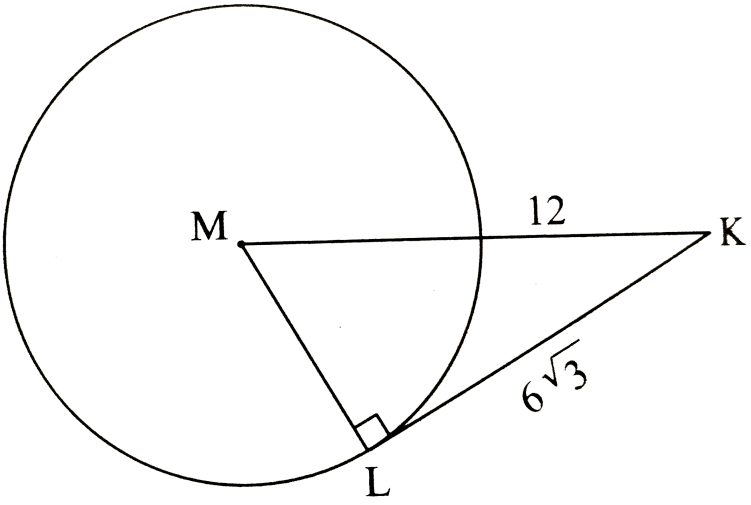
14. In the figure, M is the centre of the circle and seg KL is a tangent segment. If $MK = 12, KL = 6\sqrt{3}$ then find,

(1) Radius of the circle,

(2) Measures of $\angle K$ and $\angle M$.



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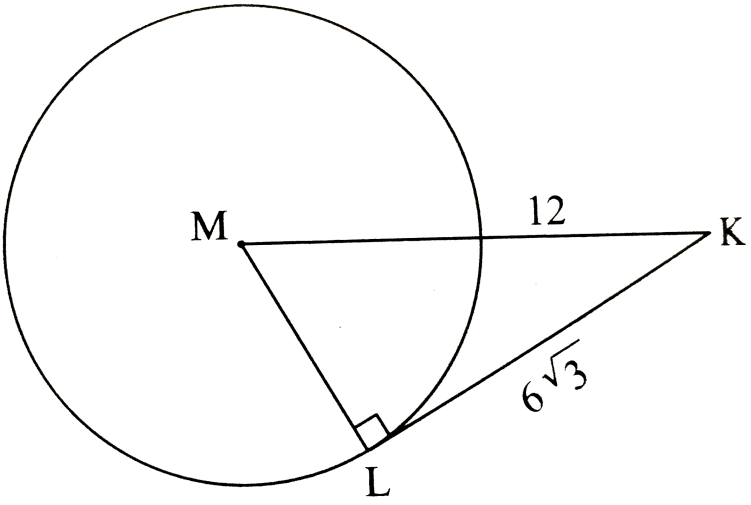
15. In the figure, M is the centre of the circle and seg KL is a tangent segment. If $MK = 12, KL = 6\sqrt{3}$ then find,

(1) Radius of the circle,

(2) Measures of $\angle K$ and $\angle M$.



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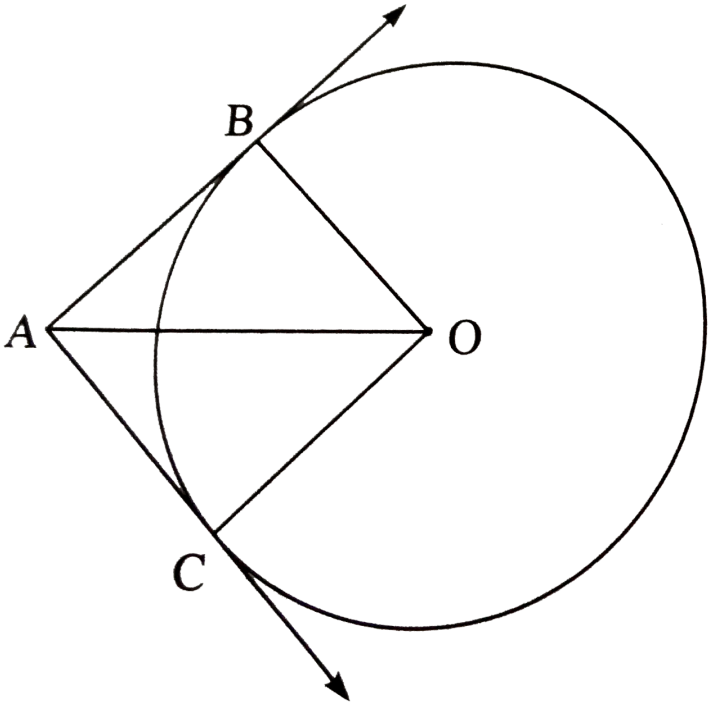
16. In the figure, O is the centre of the circle of the circle.

Seg AB, seg AC are tangent segments. Radius of the

circle is r and l(AB)=r. Prove that, $\square ABOC$ is a square.



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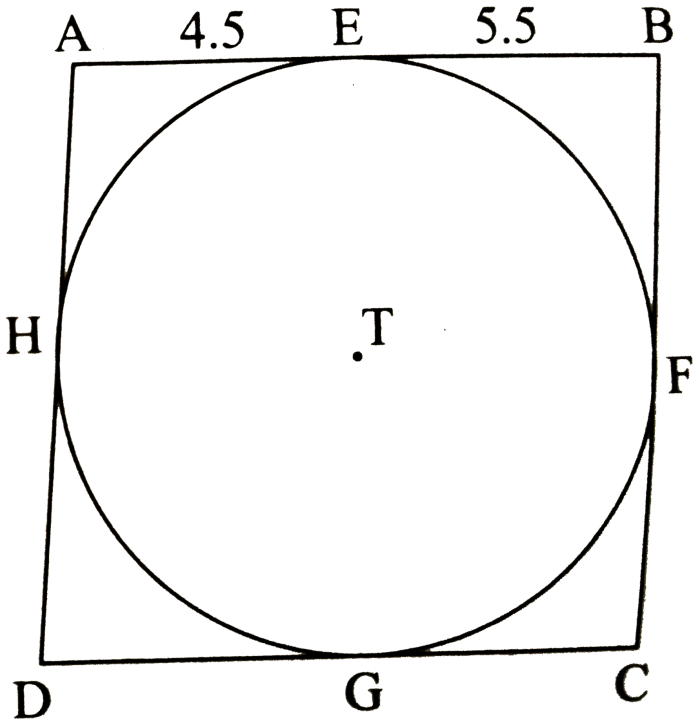
17. In the figure, $\square ABCD$ is a parallalogram. It circumscribes the cirlcle with centre T. Point E,F,G,H are

touching points. If AE = 4.5 ,EB = 5.5 , find AD.



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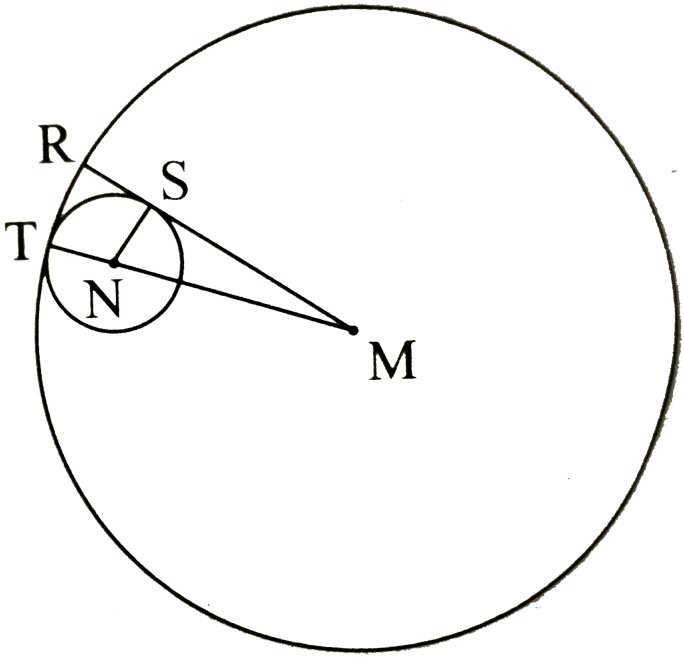
18. In the figure, circle with centre M touches the circle with centre N at point T. Radius RM touches the smaller

circle at S. Radii of circles are 9 cm and 2.5 cm. Find the answers to the following questions hence find the ratio MS : SR

(1) Find the length of segment MT

(2) Find the length of seg MN

(3) Find the measure of $\angle NSM$.



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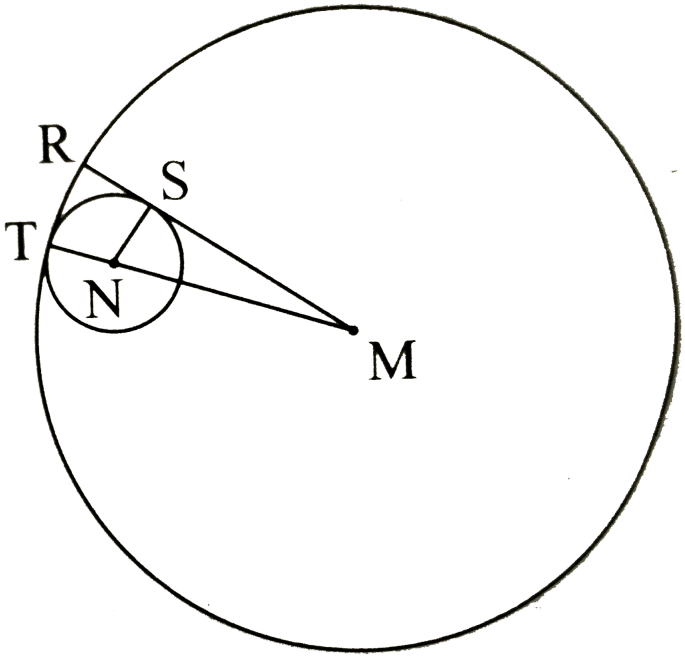
19. In the figure, circle with centre M touches the circle with centre N at point T. Radius RM touches the smaller circle at S. Radii of circles are 9 cm and 2.5 cm. Find the answers to the following questions hence find the ratio MS : SR

(1) Find the length of segment MT

(2) Find the length of seg MN

(3) Find the measure of $\angle NSM$.



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20. In the figure, circle with centre M touches the circle with centre N at point T. Radius RM touches the smaller circle at S. Radii of circles are 9 cm and 2.5 cm. Find the

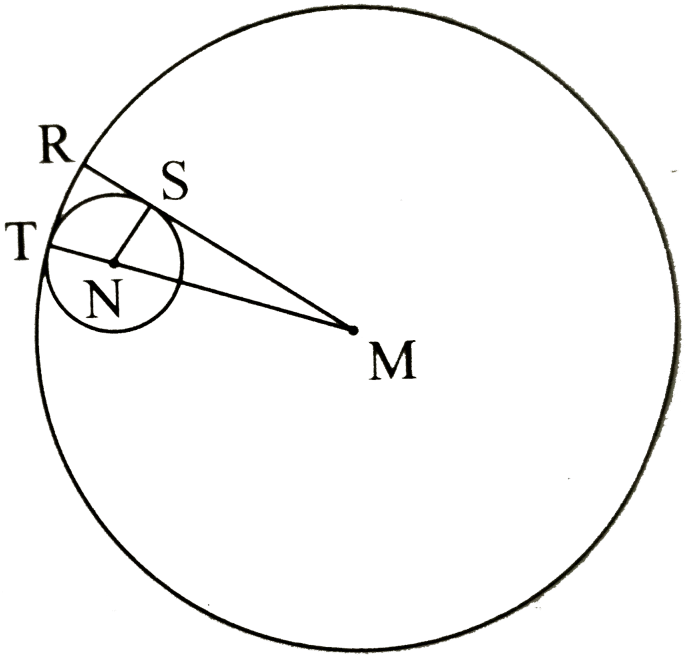
answers to the following questions hence find the ratio

MS : SR

(1) Find the length of segment MT

(2) Find the length of seg MN

(3) Find the measure of $\angle NSM$.



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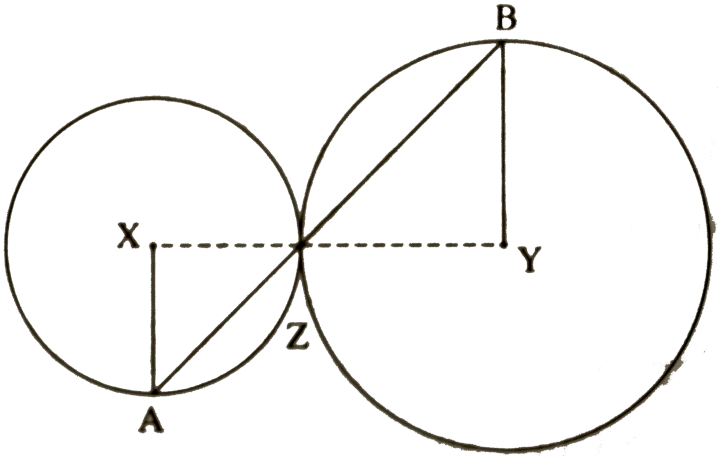
21. In the figure, circles with centres X and Y touch each other at point Z. A secant passing through Z intersects the circles at points A and B respectively. Prove that, raduis XA || radius YB. Fill in the blanks and complete the proof:



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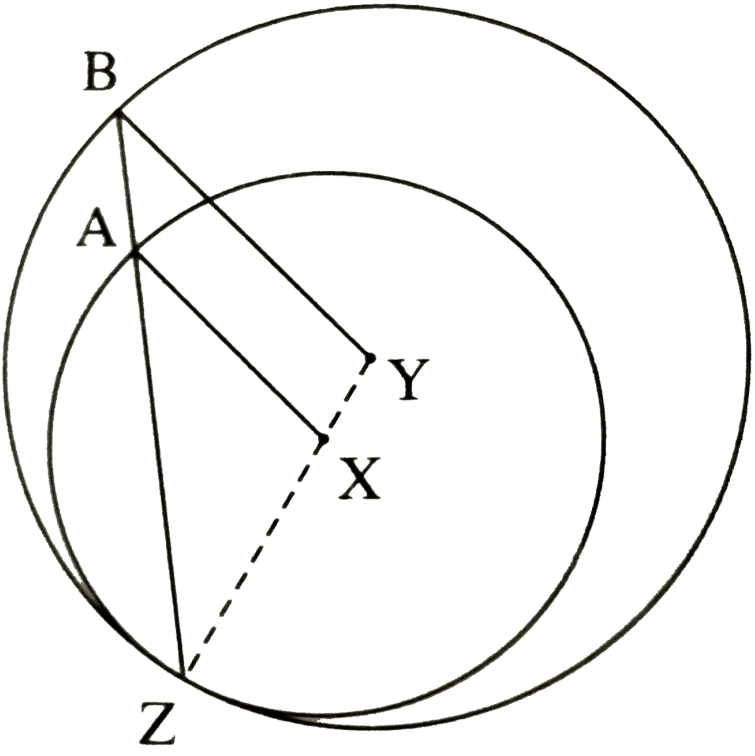
22. In the figure, circles with centres X and Y touch internally at point Z. Seg BZ is a chord of bigger circle and it intersects smaller circle at point A. Prove that, seg AX || seg BY.



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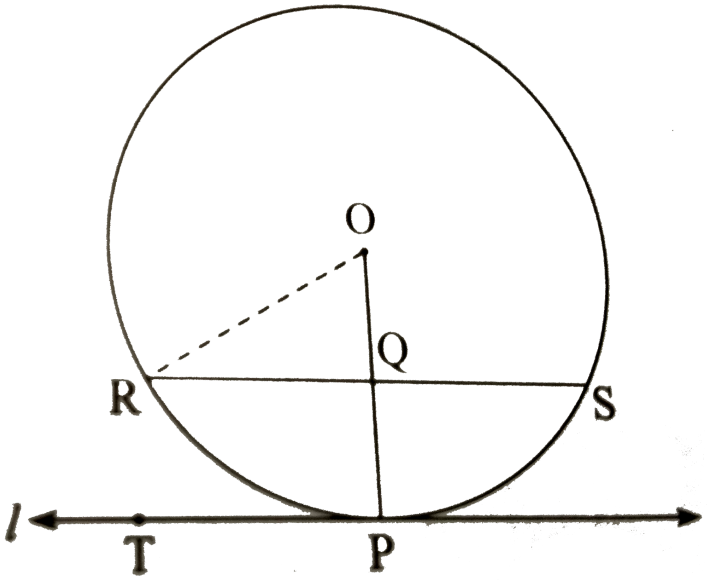
23. In the figure, line l touches the circle with centre O at point P. Q is the midpoint of radius OP. RS is a chord thorugh Q such that chords RS || line l. If RS = 12 , find the radius of the circle.



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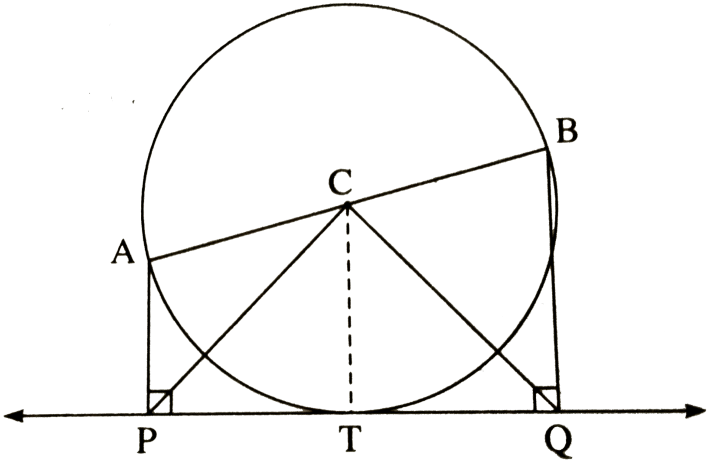
24. In the figure, seg AB is a diameter of a circle with centre C. Line PQ is a tangent, which touches the circle at point T. seg AP $\perp$ line PQ and seg BQ $\perp$ line PQ. Prove that, seg CP $\cong$ seg CQ.



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25. Draw circles with centres A,B and C each of radius 3 cm, such that each circle touches the other two circles.

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26. Prove the any three points on a circle cannot be collinear .

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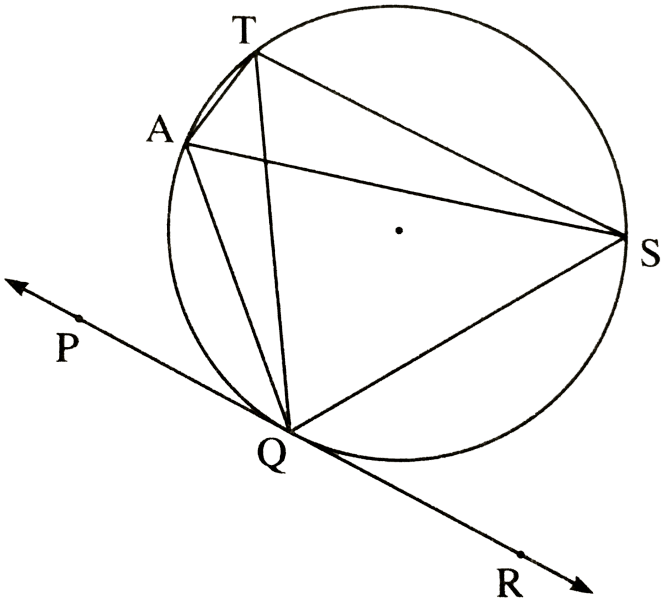
27. In the figure, line PR touches the circle at point Q. Answer the following questions with the help of the figure:

What is the sum of $\angle TAQ$ and $\angle TSQ$?



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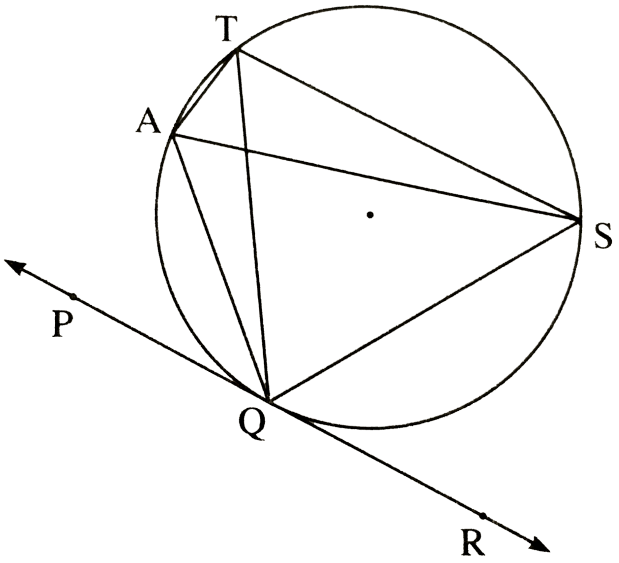
28. In the figure, line PR touches the circle at point Q. Answer the following questions with the help of the figure:

Find the angles which are congruet to $\angle AQP$.



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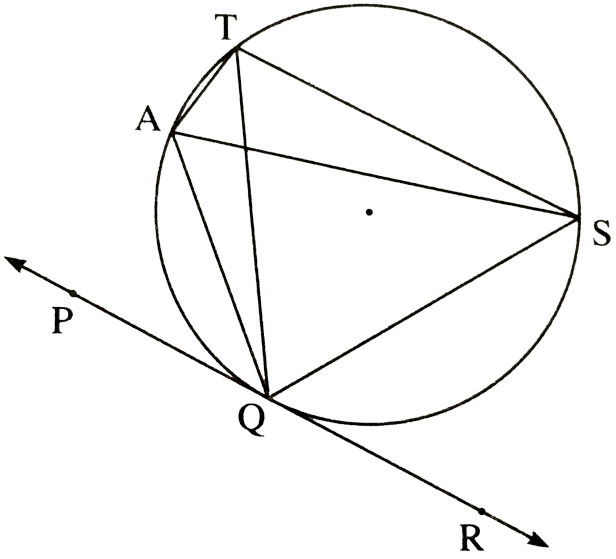
29. In the figure, line PR touches the circle at point Q. Answer the following questions with the help of the figure:

Which angles are congruent to $\angle QTS$?



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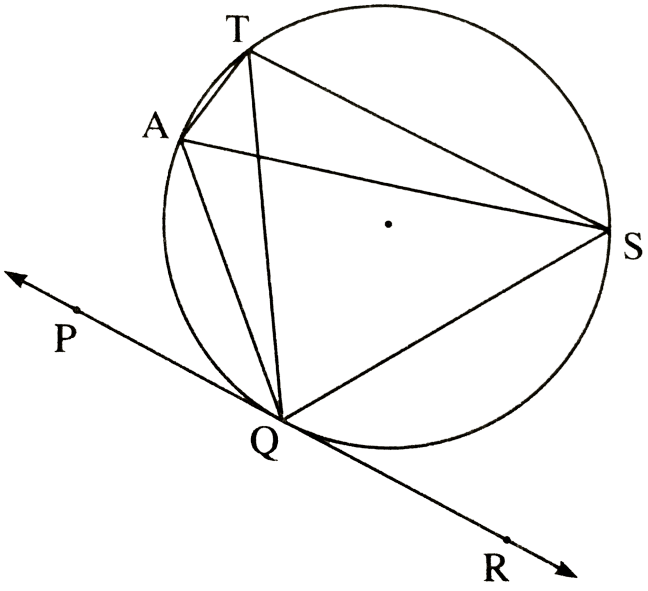
30. In the figure, line PR touches the circle at point Q. Answer the following questions with the help of the figure:

$\angle TAS = 65^\circ$,find the measure of $\angle TQS$ and arc TS.



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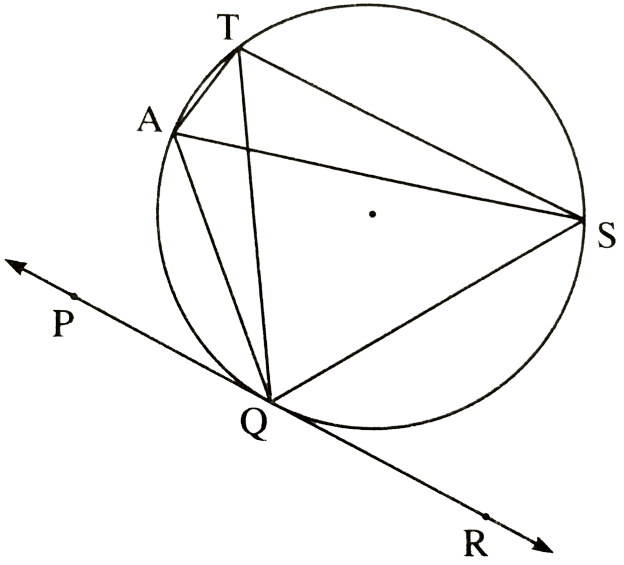
31. In the figure, line PR touches the circle at point Q. Answer the following questions with the help of the figure:

If $\angle AQP = 42^\circ$ and $\angle SQR = 58^\circ$ find measure of

$\angle ATS$.



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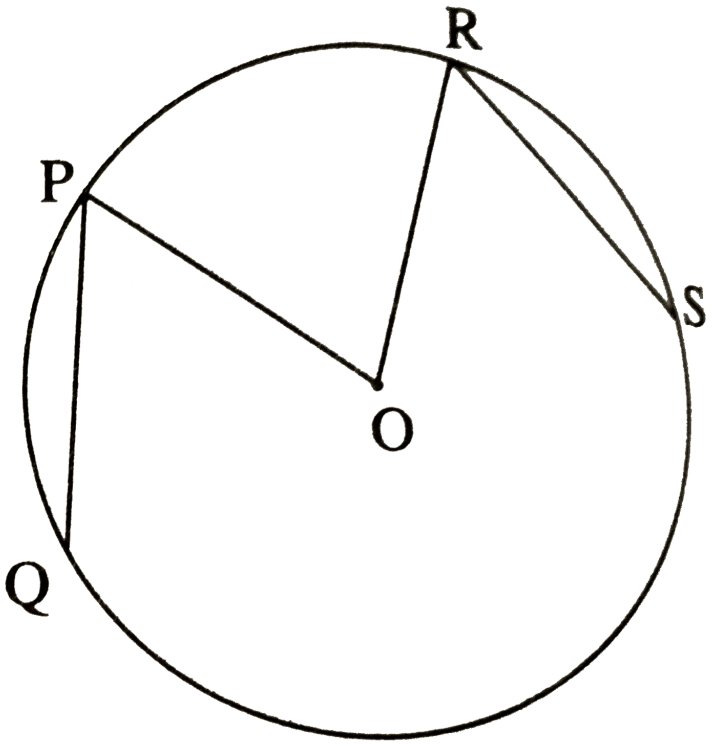
32. In the figure, O is the centre of a circle, chord PQ $\cong$ chord RS. If $\angle POR = 70^\circ$ and $m(arcRS) = 80^\circ$, find

(arc PR)



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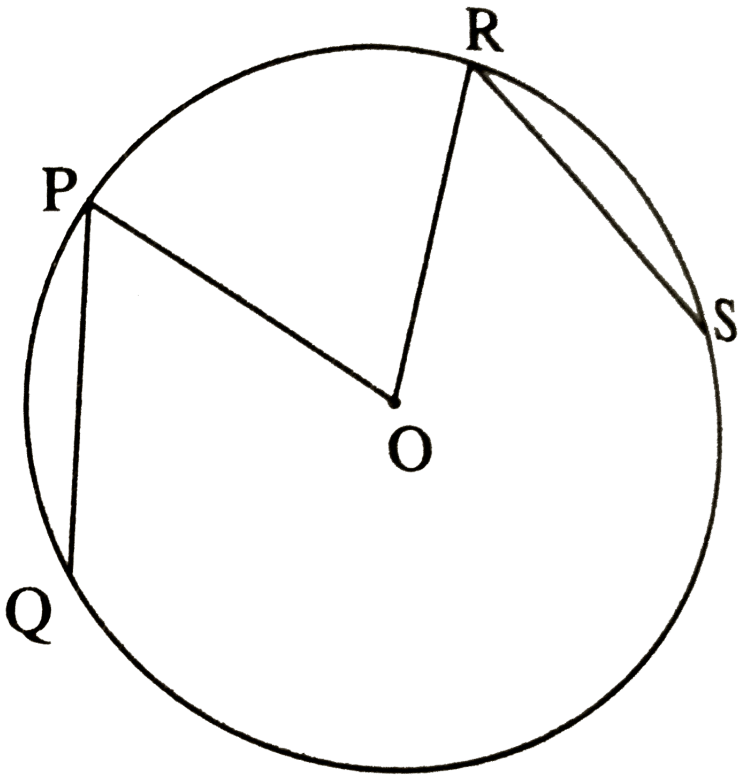
33. In the figure, O is the centre of a circle, chord PQ $\cong$ chord RS. If $\angle POR = 70^\circ$ and $m(arcRS) = 80^\circ$,

find

(arc QS)



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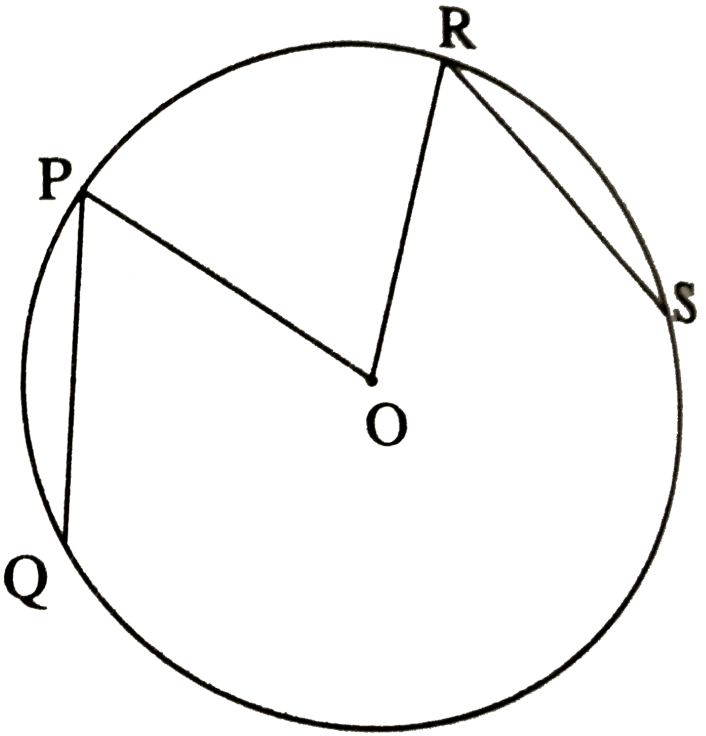
34. In the figure, O is the centre of a circle, chord PQ $\cong$ chord RS. If $\angle POR = 70^\circ$ and $m(arcRS) = 80^\circ$, find

(arc QSR)



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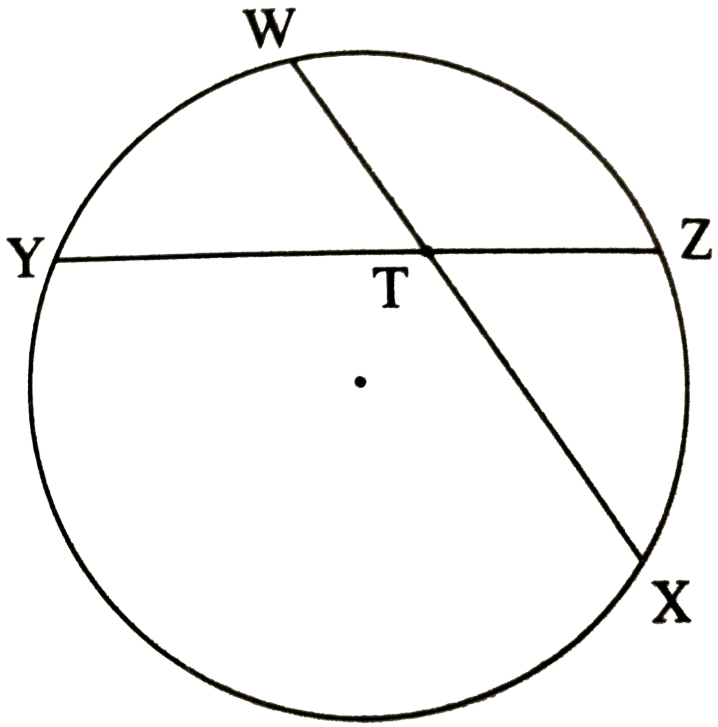
35. In the figure, m(arc WY)=44°,m(arc ZX)=68°,then

Find the measure of $\angle ZTX$.



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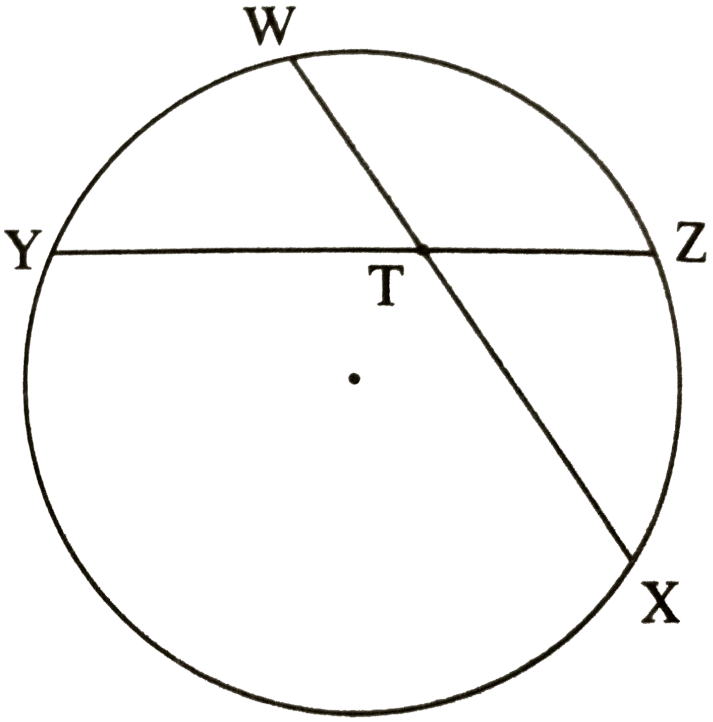
36. In the figure, m(arc WY)=44°,m(arc ZX)=68°,then

If WT=4.8, TX=8.0, YT=6.4, find TZ.



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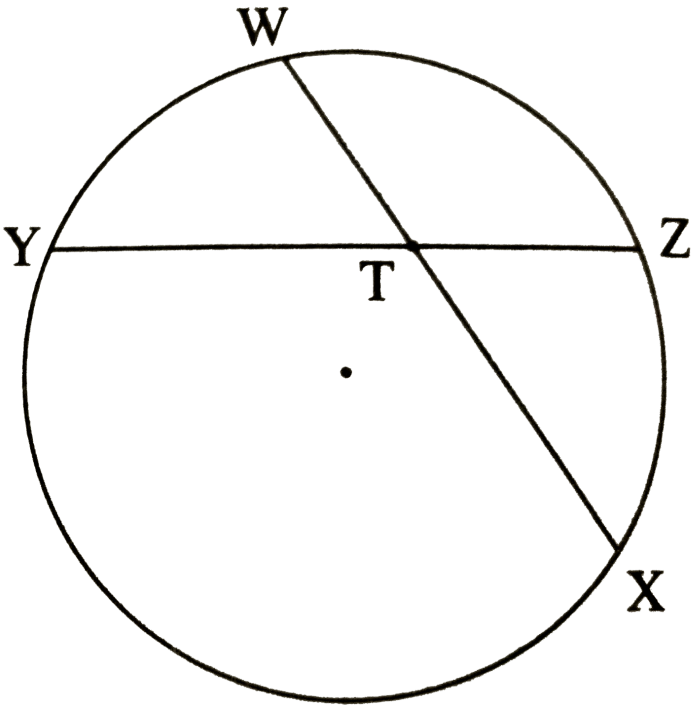
37. In the figure, m(arc WY)=44°,m(arc ZX)=68°,then

If WX=25, YT=8, YZ=26, find WT.



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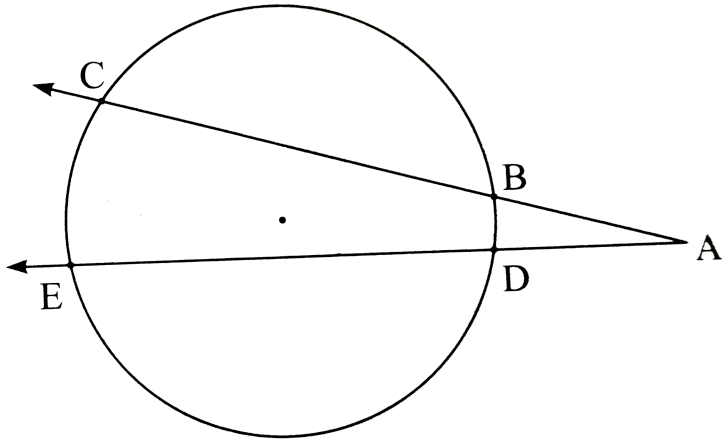
38. In the figure,

(1) m (arc CE) $= 54^\circ$, m (arc BD) 23°, find measure of $\angle CAE$.

(2) If AB = 4.2 , BC = 5.4 , AE = 12.0, find AD .

(3) If AB = 3.6, AC = 9.0 , AD = 5.4 , find AE.



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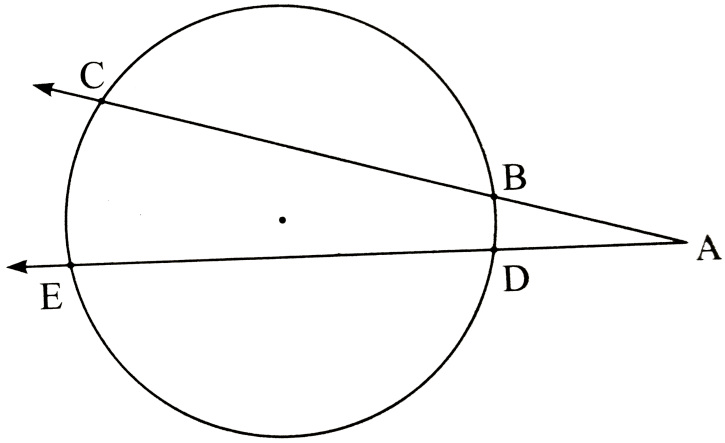
39. In the figure,

(1) m (arc CE) $= 54^\circ$, m (arc BD) 23°, find measure of $\angle CAE$.

(2) If AB = 4.2 , BC = 5.4 , AE = 12.0, find AD .

(3) If AB = 3.6, AC = 9.0 , AD = 5.4 , find AE.



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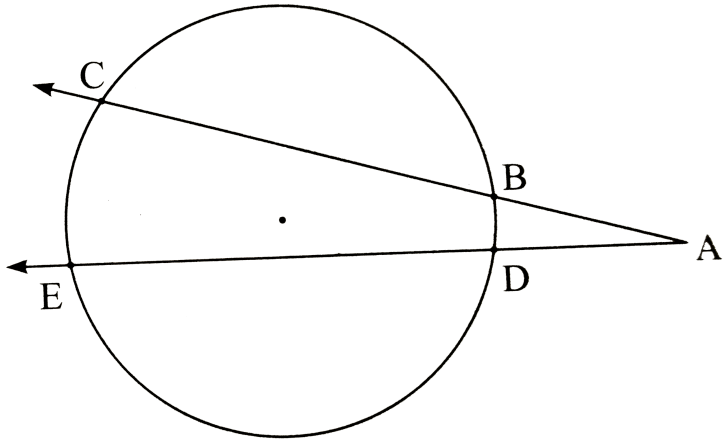
40. In the figure,

(1) m (arc CE) $= 54^\circ$, m (arc BD) 23°, find measure of $\angle CAE$.

(2) If AB = 4.2 , BC = 5.4 , AE = 12.0, find AD .

(3) If AB = 3.6, AC = 9.0 , AD = 5.4 , find AE.



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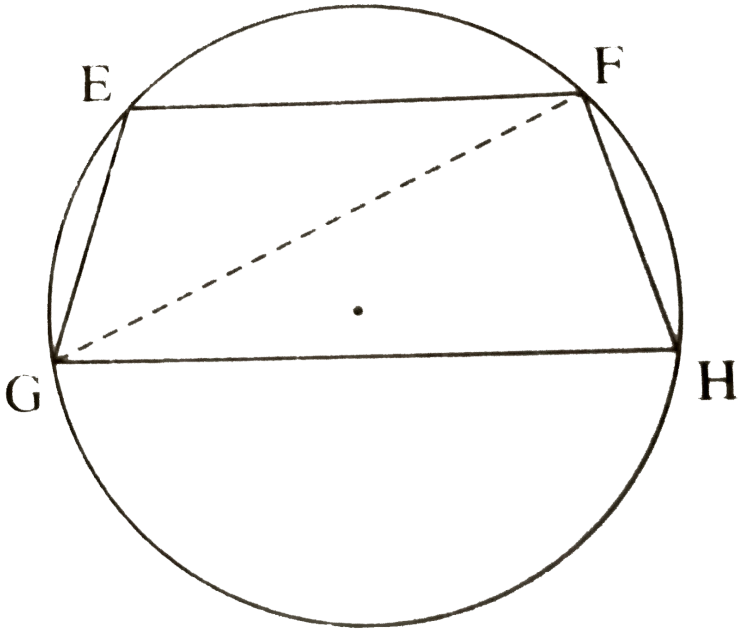
41. In the figure, chord EF || chord GH. Prove that, chord EG $\cong$ chord FH. Fill in the blanks and write the proof



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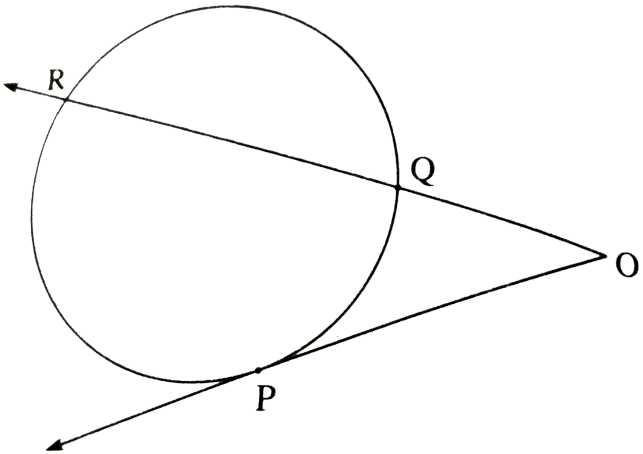
42. In the figure, P is the point of contact.

If m(arc PR)=140°, ∠POR=36°, find m(arc PQ).



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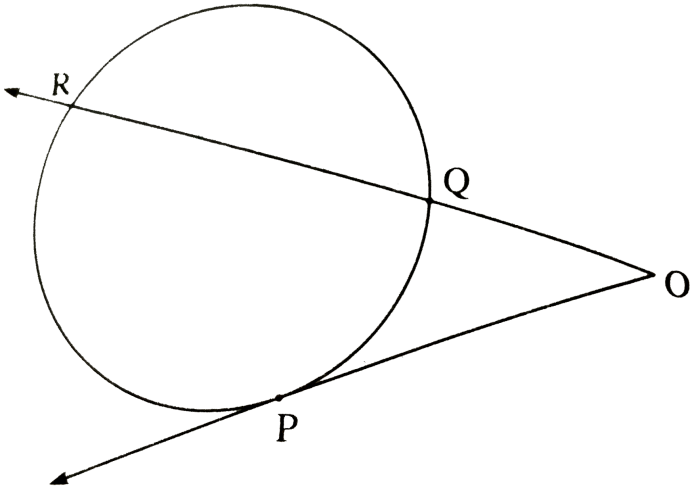
43. In the figure, P is the point of contact.

If OP=7.2,OQ=3.2, find OR and QR.



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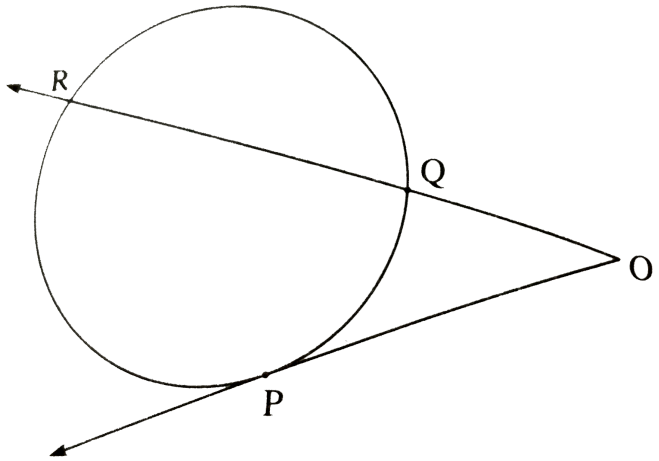
44. In the figure, P is the point of contact.

If OP=7.2,OR=16.2, find QR.



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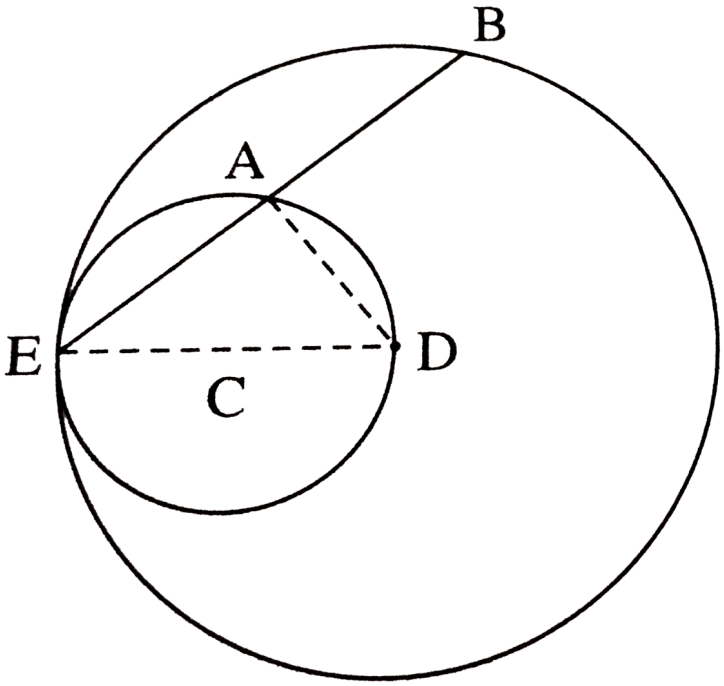
45. In figure, circles with centers C and D touch internally at point E. D lies on the inner circle. Chrd EB of the outer circle intersects inner circle at point A. Prove that, seg EA

≅ seg AB.



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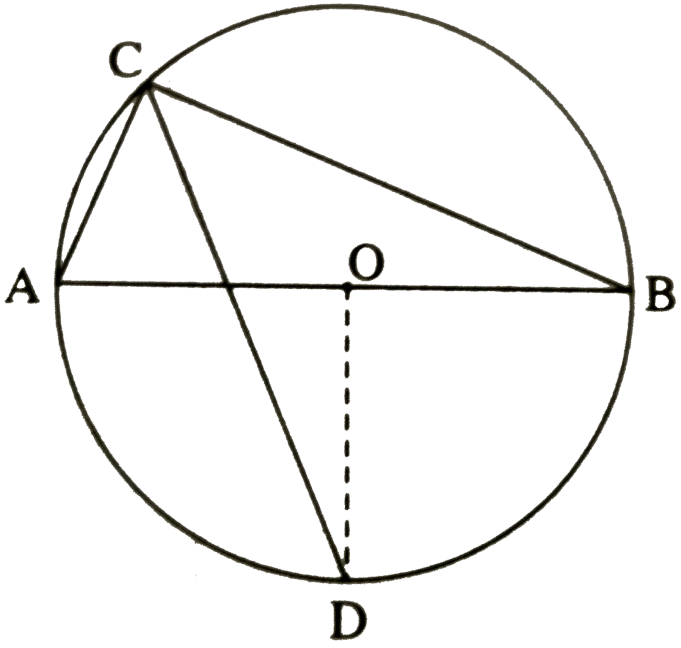
46. In figure, seg AB is a diameter of a circle with centre O. The bisector of $\angle ACB$ intersects the circle at point D. Prove that seg AD ≅ seg BD. Complete the following

proof by filling in the blanks



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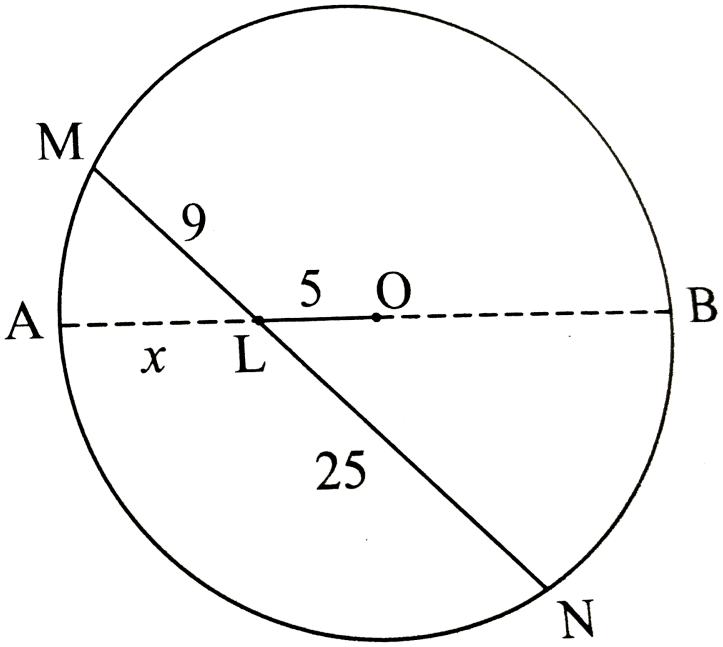
47. In the figure, seg MN is a chord of a circle with centre O. MN = 15, L is a point on chord MN such that ML = 9

and d(O, L) = 5. Find the radius of the circle.



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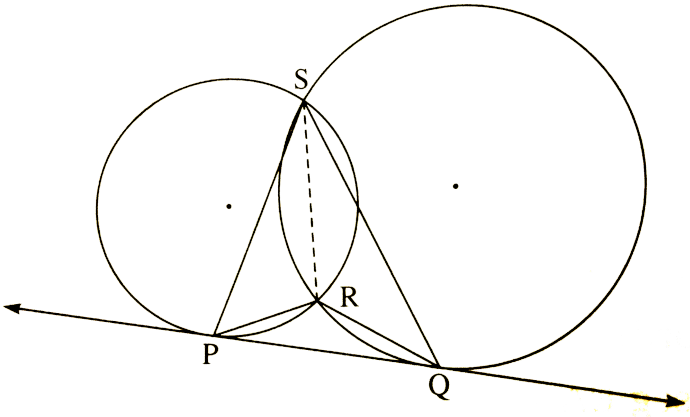
48. In figure, two circles intersect each other at points S and R. Their common tangent PQ touches the circle at

points P,Q. Prove that, $\angle PRQ + \angle PSQ = 180^\circ$.



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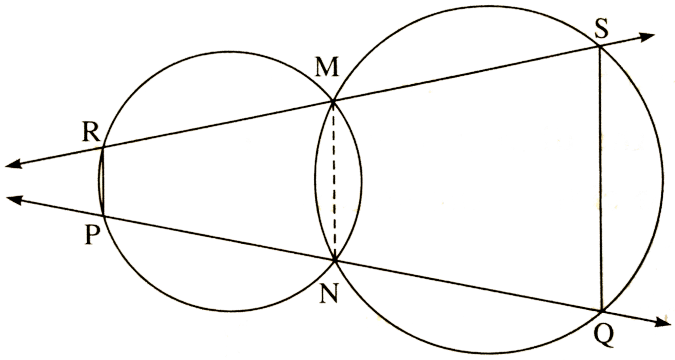
49. In figure, two circles intersect at points M and N. Secants drawn through M and N intersect the circles at points R,S and P,Q respectively. Prove that : seg SQ || seg

RP.



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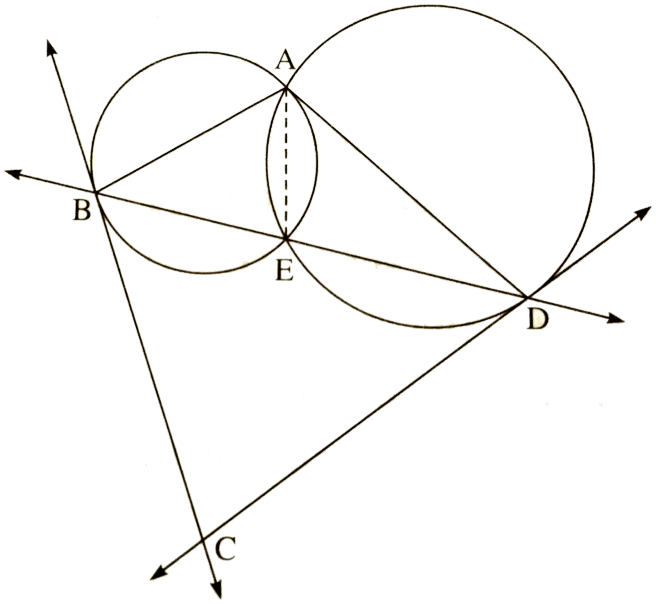
50. In figure, two circles intersect each other at points A and E. Their common secant through E intersects the circles at points B and D. The tangents of the circles at points B and D intersect each other at point C. Prove

that □ ABCD is cyclic.



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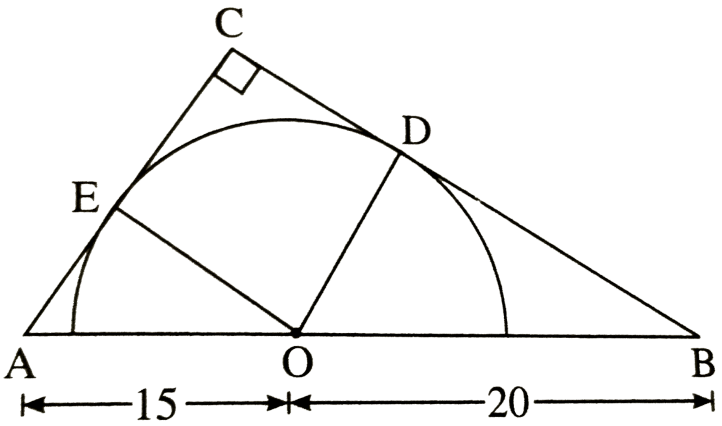
Challenging Questions

1. In the figure, a semicircle with its diameter on the hypotenuse of a right angled triangle, is shown touching

the remaining sides of the triangle. The two parts of the hypotenuse made by the centre of the semicircle have lenghs 15 cm and 20 cm respectively. Find the radius of the semicicle.



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2. A square has two of its vertices on a circle and the other two on the tangent to the circle. If the diameter of the circle is 10. determine the side of the square.

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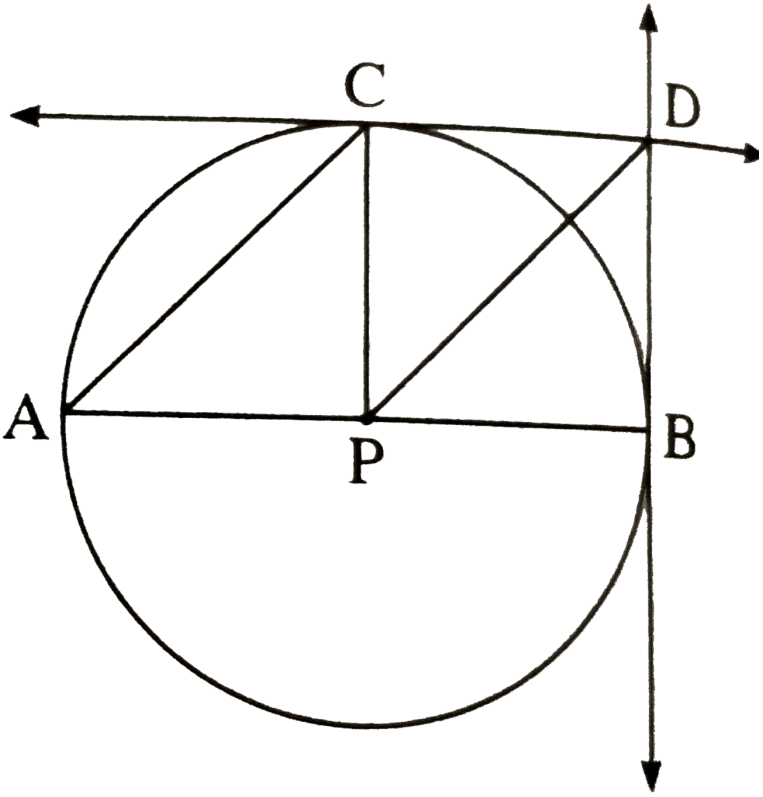
3. Seg AB is a diameter of a circle with centre P. Seg AC is a chord. A secant through P and parallel to seg AC intersects the tangent drawn at C in D. Prove that line

DB is a tangent to the circle.



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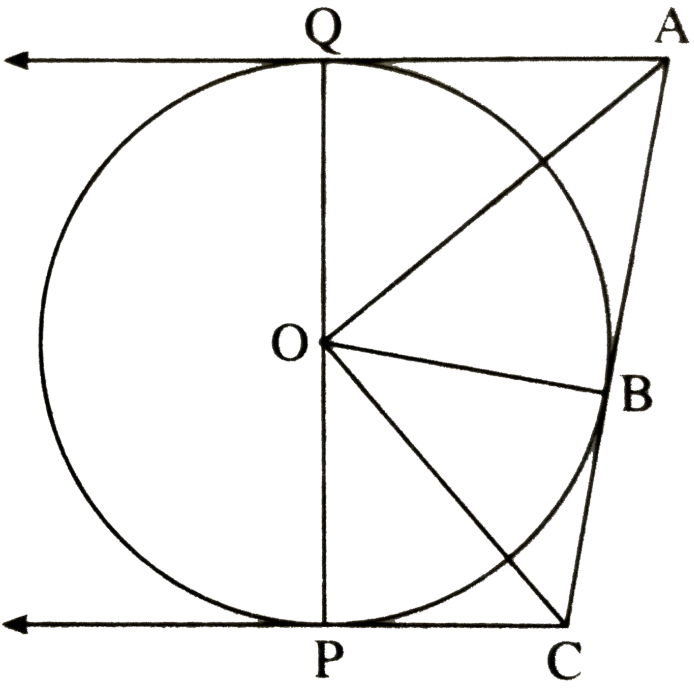
4. In the figure, points P, B and Q are points of contact of respective tangents. Line QA is parallel to line PC. If

QA=7.2 cm , PC=5 cm, find the radius of the circle.



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5. If the diagonals of a cyclic quadrilateral are perpendicular to each other, show that the line passing

through the point of intersection of diagonals and midpoint of a side is perpendicular to the opposite side.

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6. A cyclic trapezium is isosceles and its diagonals are equal.

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7. The diagonals of cyclic quadrilateral ABCD are congruent. Show that AD=BC and seg AB || seg CD.

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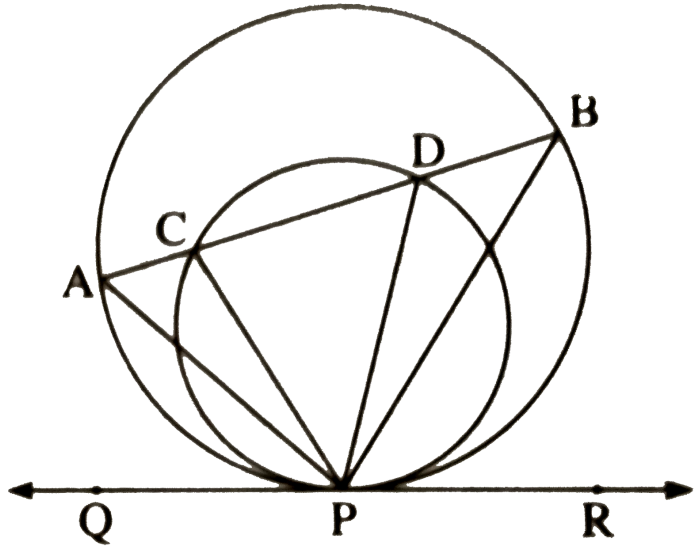
8. In the figure, two circles touch internally at point P. chord AB of the larger circle intersects the smaller circle in C and D. Prove $\angle CPA \cong \angle DPB$.



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9. The quadrilateral formed by angle bisectors of a cyclic quadrilateral is also cyclic.

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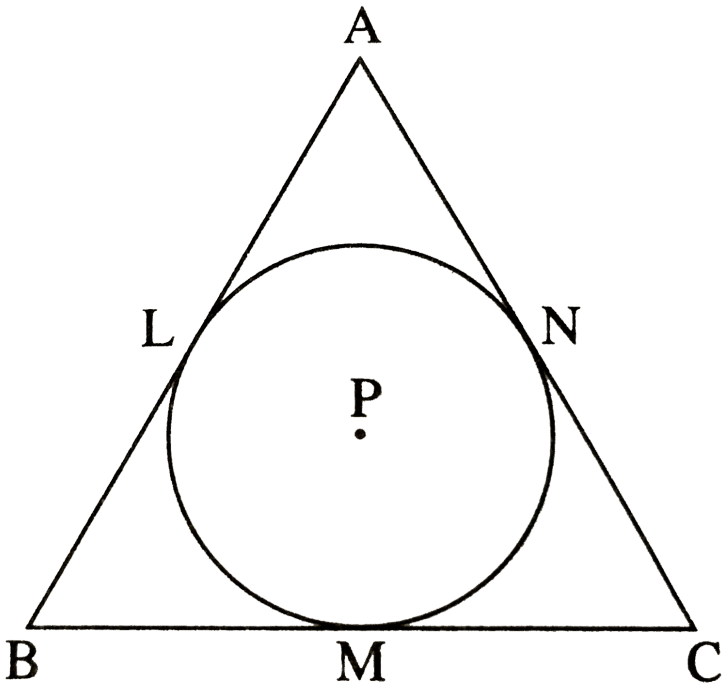
10. A circle with centre P is inscribed in the $\triangle$ ABC. Side AB, side BC and side AC touch the circle at points L,M and N respectively. Radius of the circle is r. Prove that:

$$A(\triangle ABC) = \frac{1}{2}(AB + BC + AC) \times r.$$



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