



MATHS

BOOKS - CHETAN MATHS (TAMIL ENGLISH)

CIRCLE

Practice Set 3 1

1. In the adjoining figure, the radius of a circle with center C is 6 cm . Line AB is a tangent at A .

Answer the following question .

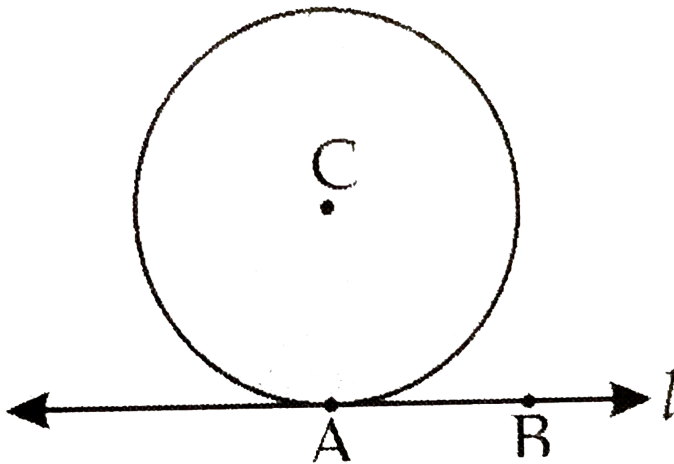
what is the measure of $\angle CAB$? Why ?

What is the distance of point C from line AB ?

Why ?

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

(iv) What the measure of $\angle ABC$? Why ?



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2. In the adjoining figure, O is the centre of the circle. From point R, seg RM and RN are tangent segments drawn which touch the circle at M, N .

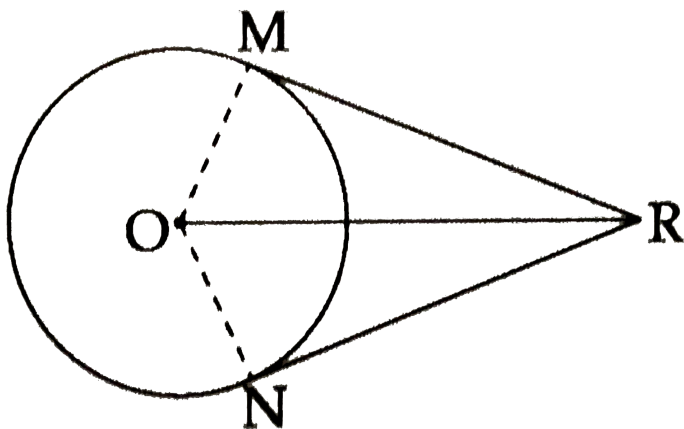
If $OR = 10$ cm, radius of the circle = 5 cm, then

find

(i) the length of each tangent segment

(ii) Measure of $\angle MRO$

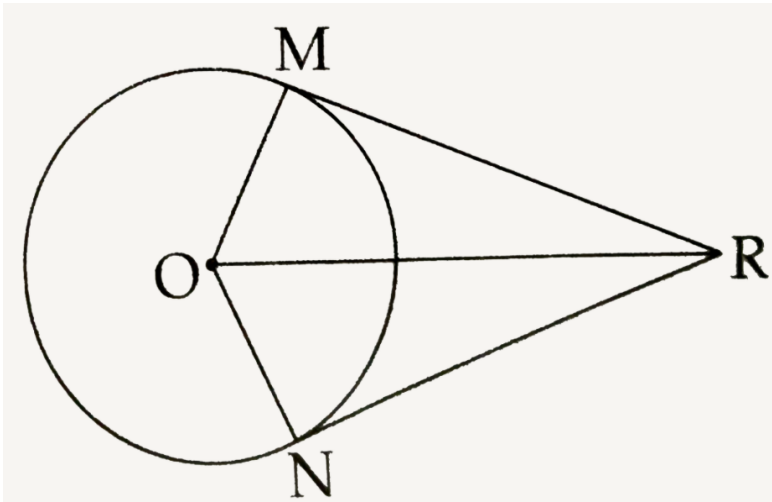
(iii) Measure of $\angle MRN$





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3. In the figure, seg RM and seg RN are tangent segments of a circle with centre O . Prove that seg OR divides $\angle MRN$ as well as $\angle MON$



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4. What is the distance between two parallel tangents of a circle having radius 4.5 cm .

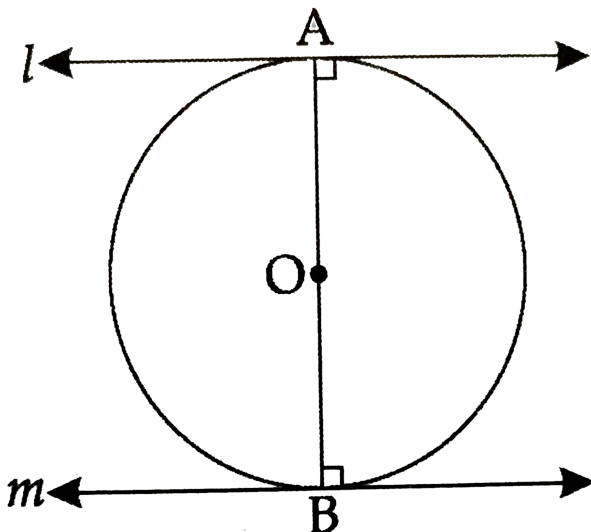
Justify your answer

Given :

(i) A circle with center O and radius 4.5 cm .

(ii) Line l is tangent to the circle at point A

(iii) Line m is tangent to the circle at point B





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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 their centres .

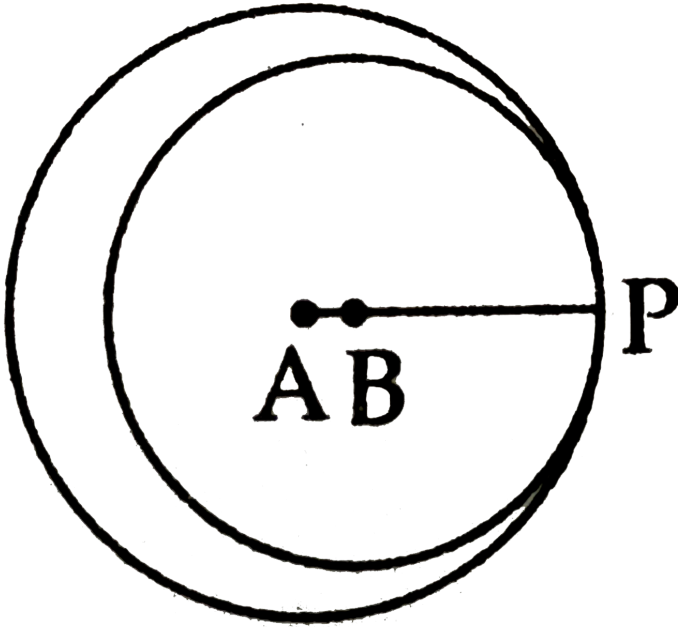
Given :

(i) Two circles with centres A and B touch each other internally at point P .

(ii) Radius of circle with centre A is 4 . 8 cm .

(iii) Radius of circle with center B is 3 . 5 cm .

To Find : AB



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2. Two circle having radii 5.5 cm, 4.2 touch each other externally . Find distance between

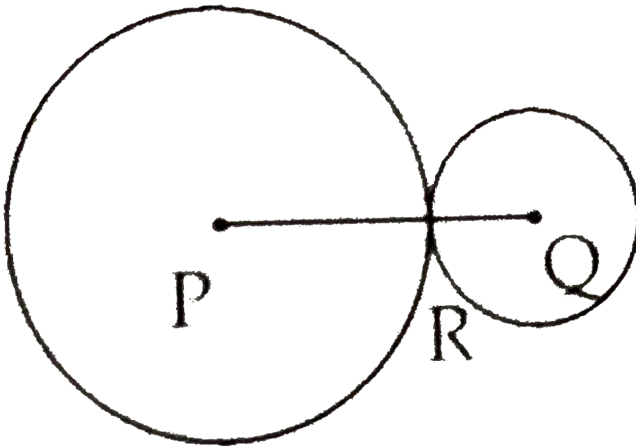
their centres ?

Given :

(i) Two circles with centres P and Q touch each other externally at point R .

(ii) Radius of circle with centre P is 5 . 5 cm

(iii) Radius of circle with centre Q is 4 . 2 cm



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3. Draw two externally touching circles and internally touching circles with radii 4 cm and 2.8 cm ,



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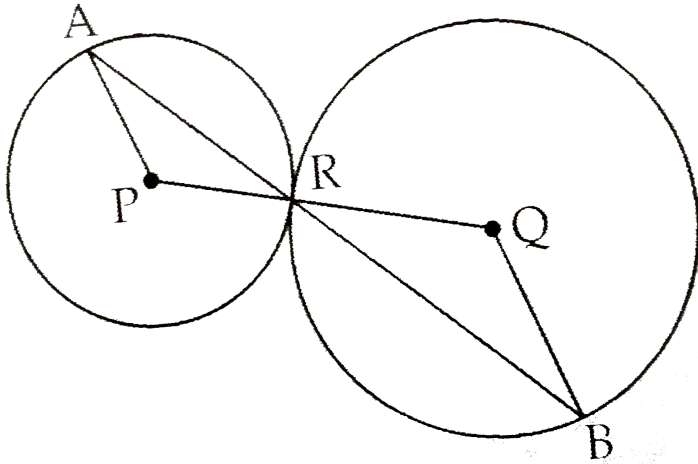
4. In the adjoining figure the circles with centers P and Q touch each other at R . A line passing through R meets the circles at A and B respectively then

Prove that :

(i) $\text{seg } AP \parallel \text{seg } BQ$.

(ii) $\triangle APR \sim \triangle RQB$.

(iii) Find $\angle RQB$ if $\angle PAR = 35^\circ$



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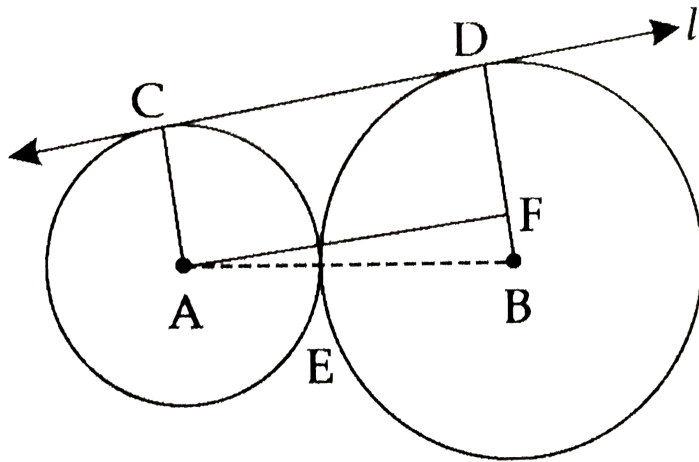
5. In the adjoining figure, the circles with centres A and B touch each other at E. Line l is a common tangent that touches the circles at C

and D respectively. Find length of seg CD if the radii of the circles are 4 cm, 6 cm ?

Construction :

Draw seg AE and seg EB.

Draw seg AF \perp seg BD, B - F - D



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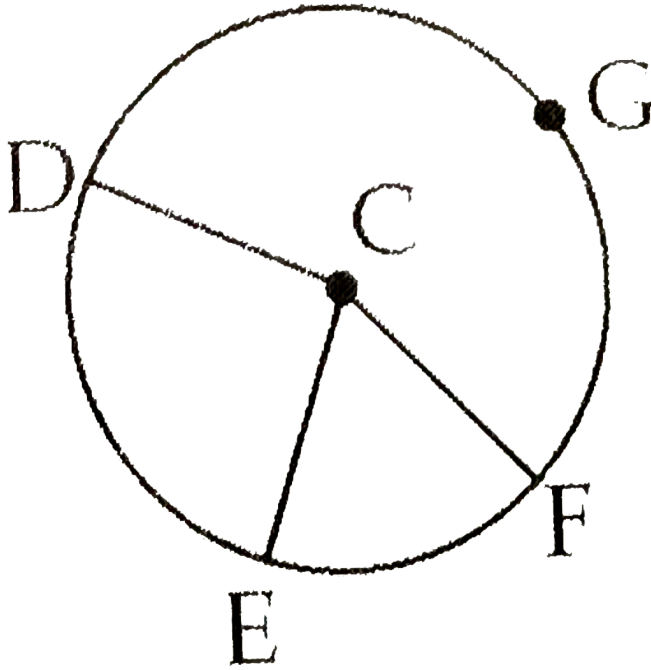
Practice Set 3 3

1. In the adjoining figure, G, D, E, F are concyclic points of a circle with centre C . $\angle ECF = 70^\circ$

$m(\text{arc DGF}) = 200^\circ$ find

(i) $m \text{ arc DE}$

(iii) $m(\text{arc DEF})$.

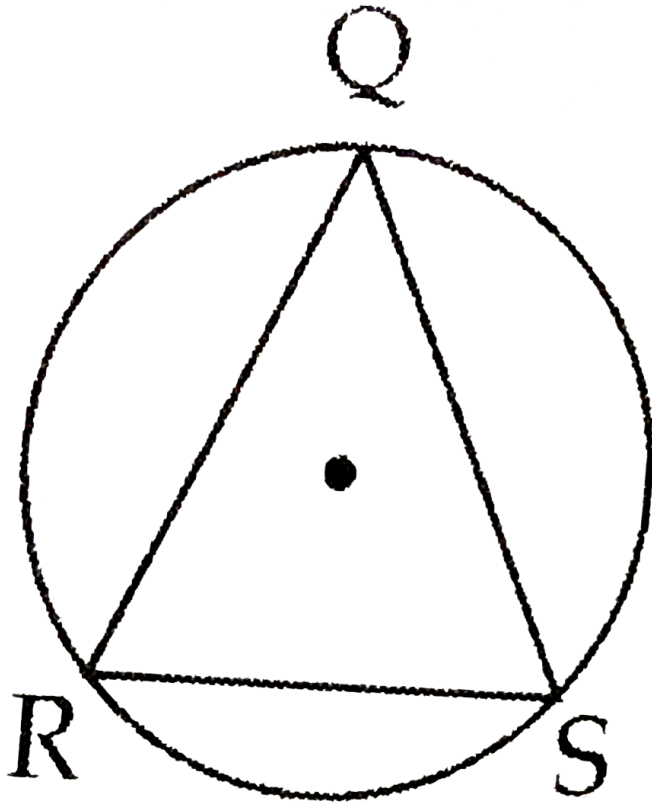


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2. In the adjoining figure, $\triangle QRS$ is an equilateral triangle.

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

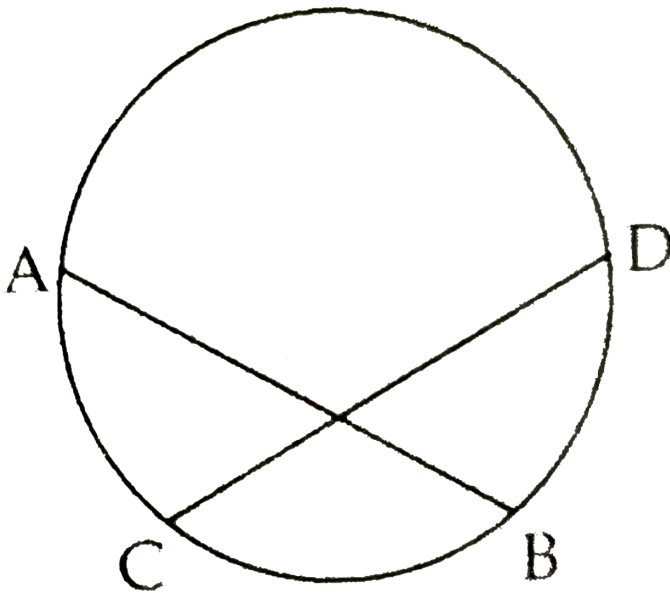
(2) $m(\text{arc } QRS) = 240^\circ$.





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



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Practice Set 3 4

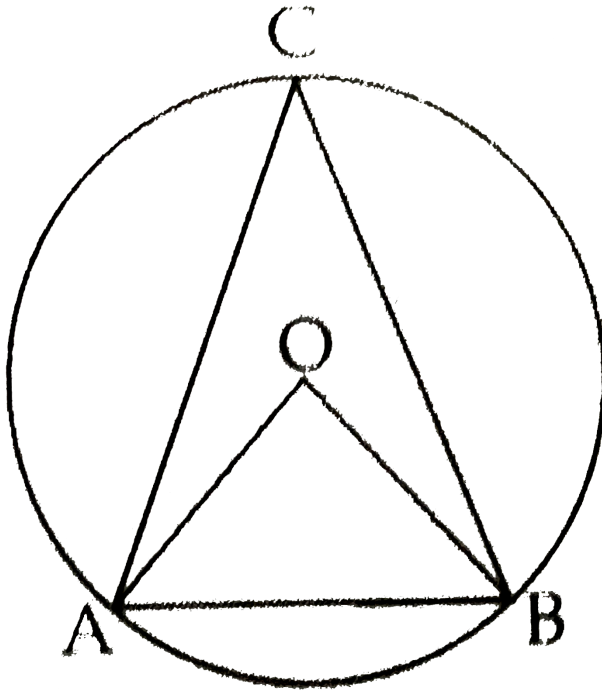
1. In the adjoining figure, point O is the centre of the circle . Length of chord AB is equal to the radius of the circle . Find

(i) $\angle AOB$

(ii) $\angle ACB$

(iii) $\text{nm}(\text{arc } AB)$

(iv) $m(\text{arc } ACB)$



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2. In the adjoining figure, $\square PQRS$ is a cyclic quadrilateral. Side $PQ \cong$ side RQ .

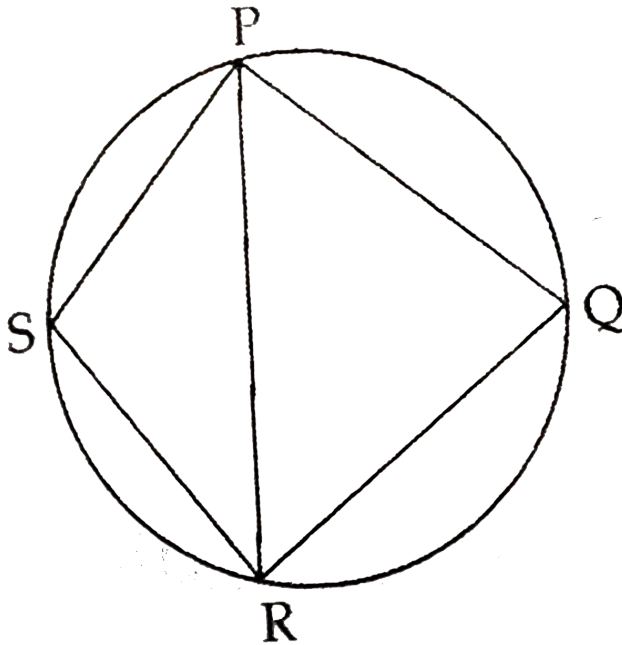
$\angle PSR = 110^\circ$. Find

(i) $\angle PQR$

(ii) m (arc PQR)

(iii) m (arc QR)

(iv) $\angle PRQ$

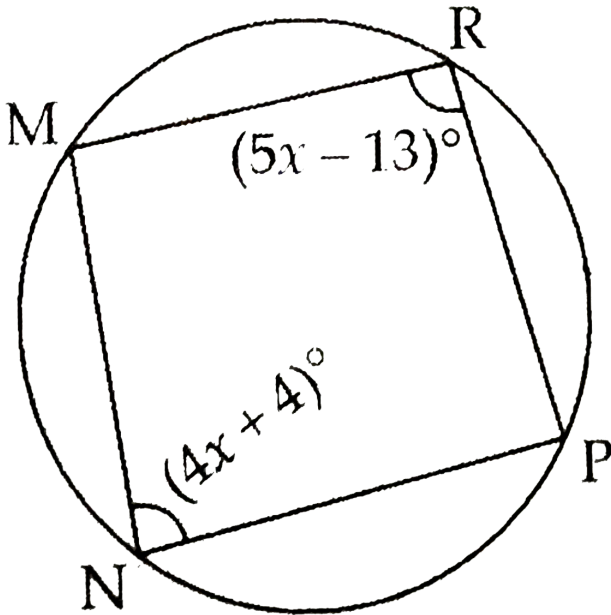


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3. In cyclic $\square MRPN$

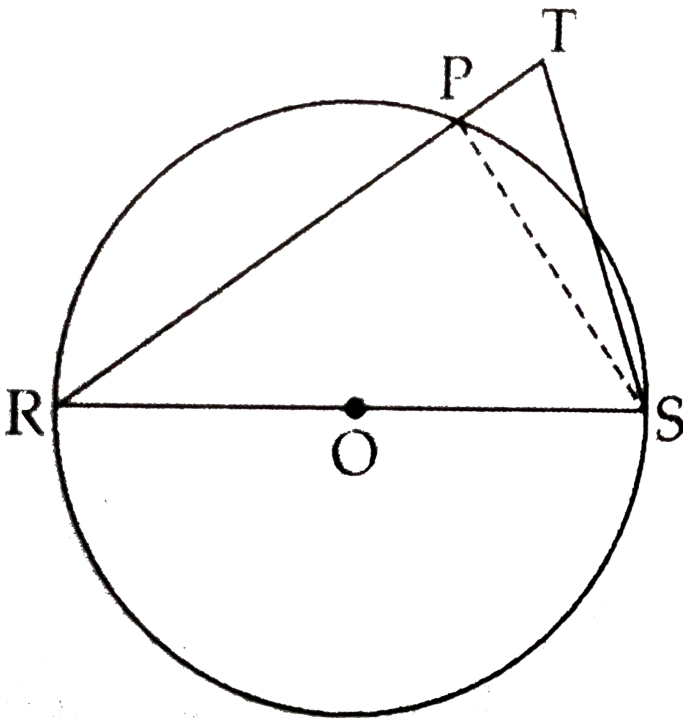
$\angle R = (5x - 13)^\circ$ and $\angle N = (4x + 4)^\circ$. Find

the measures of $\angle R$ and $\angle N$.



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4. In the adjoining figure seg RS is the diameter of the circle with centre 'O'. Point T is in the exterior of the circle. Prove that $\angle RTS$ is an acute angle.



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5. Prove that any rectangle is a cyclic quadrilateral .

Given : $\square PQRS$ is rectangle

To prove : $\square PQRS$ is cyclic quadrilateral

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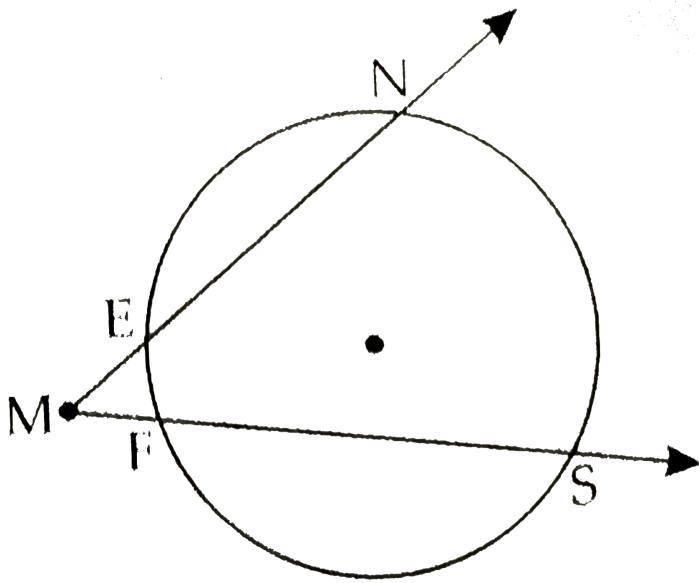
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6. In the adjoining figure, $m(\text{arc } NS) = 125^\circ$

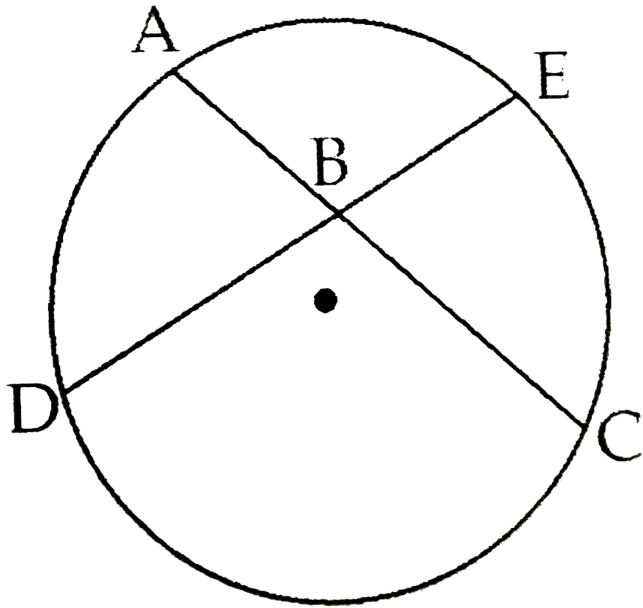
$m(\text{arc } EF) = 37^\circ$. Find $m \angle NMS$.



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7. In the adjoining figure, chord AC and chord DE intersect at point B . If $\angle ABE = 108^\circ$ and $m(\text{arc } AE) = 95^\circ$, then

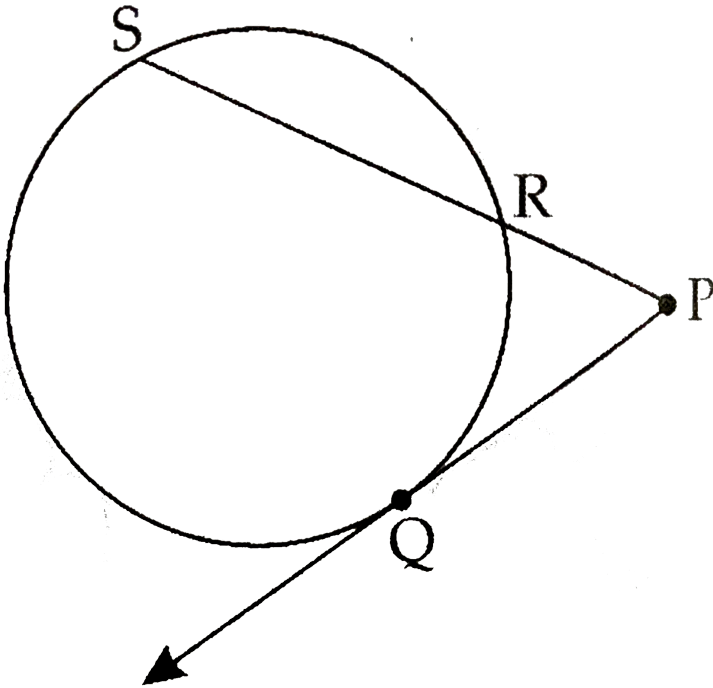
find $m(\text{arc DC})$.



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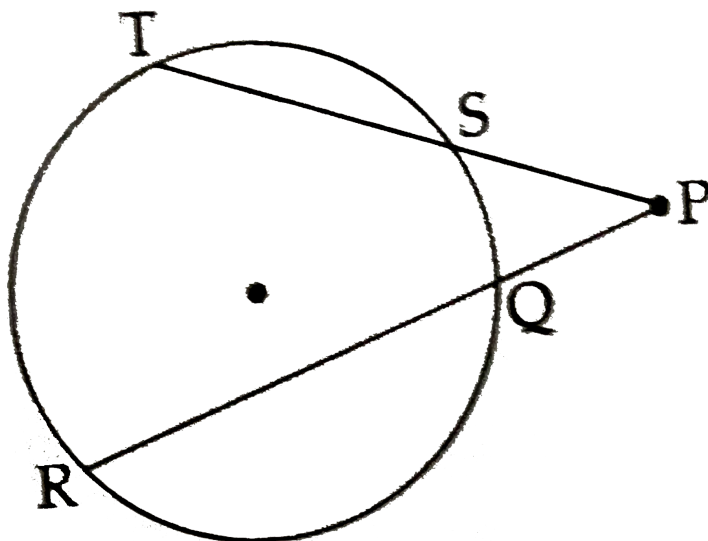
Practice Set 3 5

1. In the adjoining figure, point Q is the point of contact of tangent and circle . If $PQ = 12$, $PR = 8$, then find PS and RS .



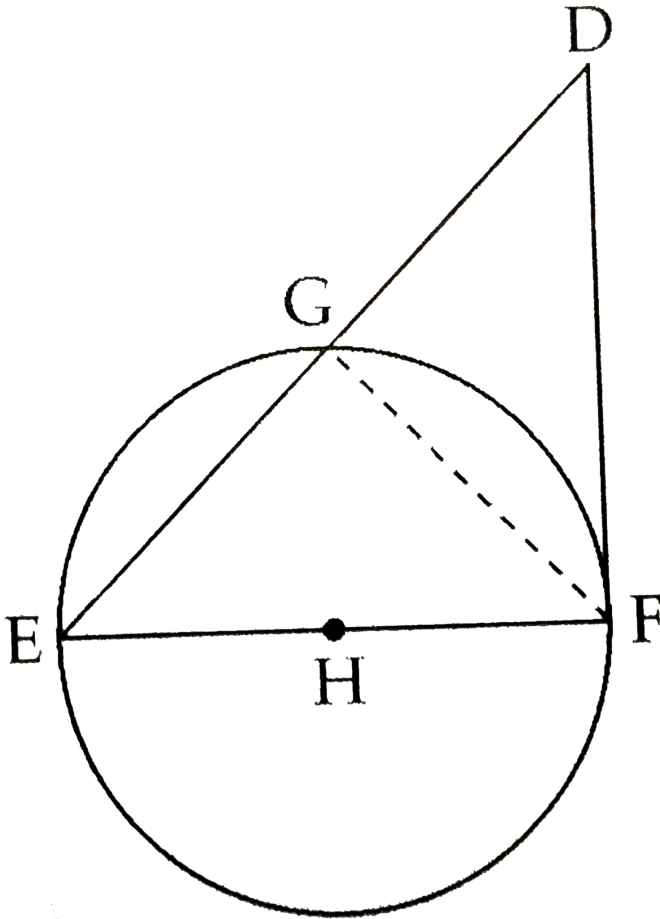
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3. In the adjoining figure, if $PQ = 6$, $QR = 10$, $PS = 8$, then find TS .



4. In the adjoining figure, seg EF is the diameter of the circle with centre H . Line DF is tangent at point F . If r is the radius of the circle, then prove that $DE \times GE = 4r^2$

To Prove : $DE \times GE = 4r^2$



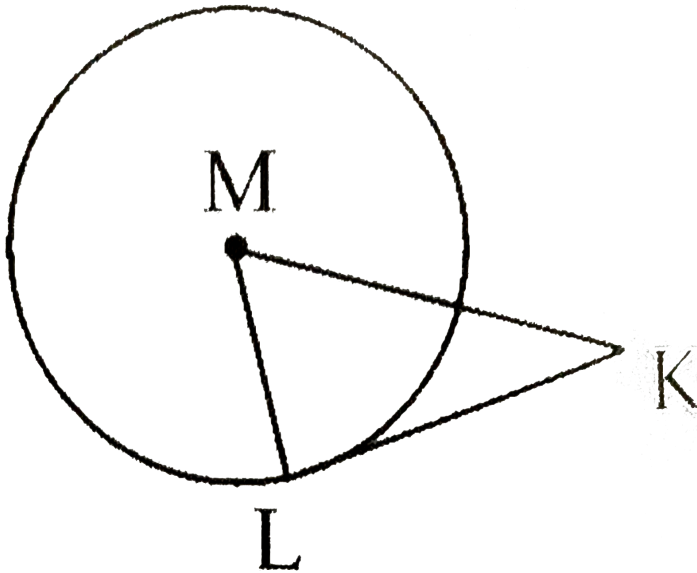
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Problem Set 3

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

(i) Find radius of the circle.

(ii) Find measure of $\angle K$ and $\angle M$.



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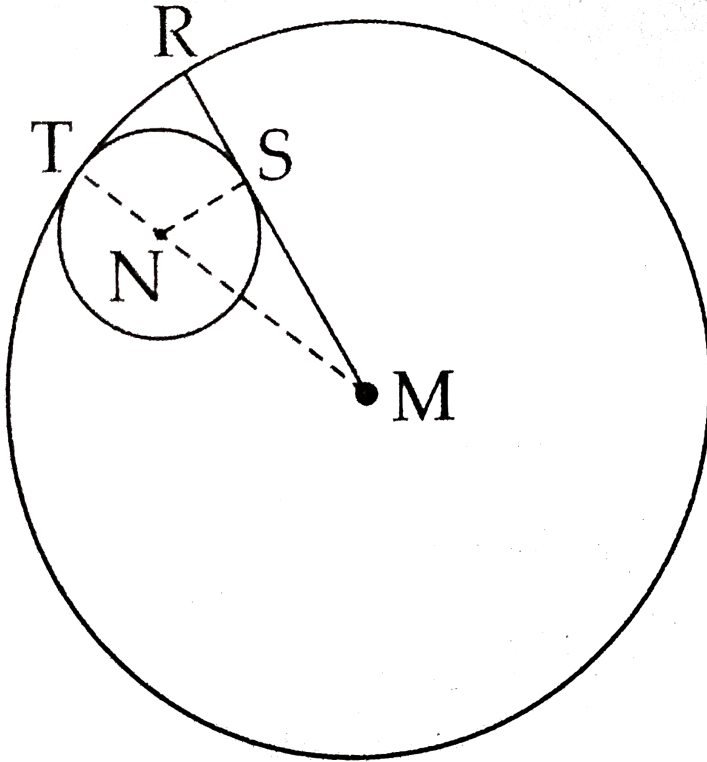
2. In the adjoining figure, circle with centre M touches the circle with center N at point T . Radius MR touches the smaller circle at S . Radii

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

(i) Find the length of seg MT

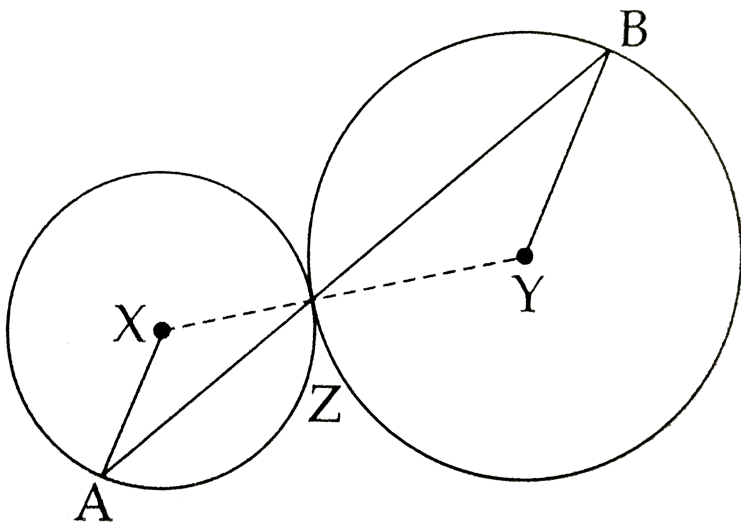
(ii) Find the length of seg MN

(iii) Find measure of $\angle NSM$.



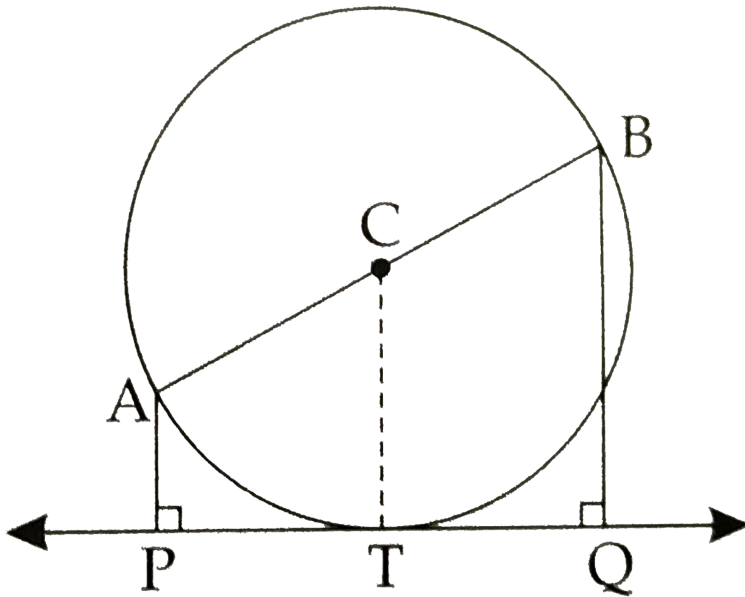
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3. In the adjoining fig. circles with centres X , Y touch each other at Z . A secant passing through Z meets the circles at A and B respectively. Prove that, radius $X A \parallel$ radius $Y B$.
Fill in the blanks and complete the proof.



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4. In the adjoining figure, seg AB is a diameter of a circle with centre C . Line PQ is a tangent, it touches the circle at T. segs AP and BQ are perpendiculars to line PQ. Prove $\text{seg } CP \cong \text{seg } CQ$.



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5. Draw circles with centres A, B, C each with radius 3 cm such that each circle touches the remaining two circles.



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6. Prove that any three points on a circle cannot be collinear.



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7. In the adjoining figure, line PR touches the circle at point Q . Using the information given in the diagram, answer the following questions.

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

(ii) Write names of angles congruent to $\angle AQP$.

(iii) Write names of angles congruent to $\angle QTS$

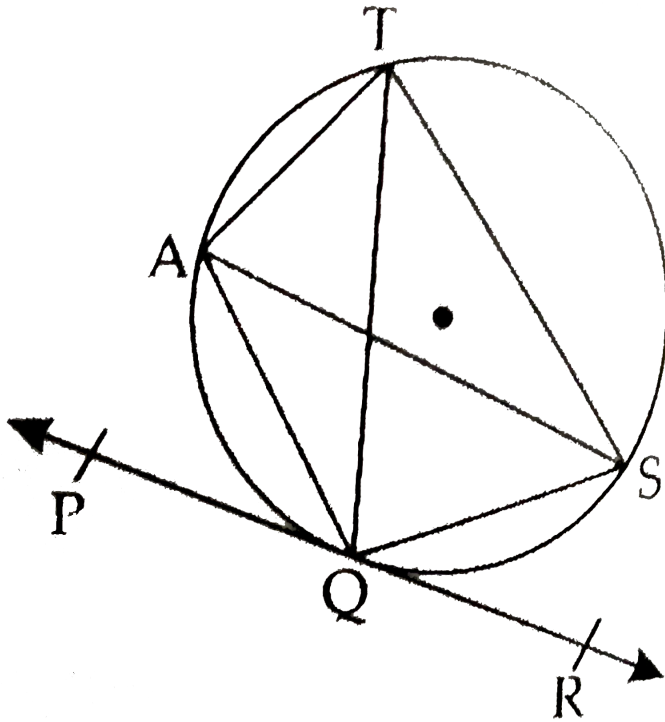
.

(iv) If $\angle TAS = 65^\circ$, then find $\angle TQS$ and arc

TS .

(v) It $\angle AQR = 42^\circ$ and $\angle SQR = 58^\circ$, then

find $\angle ATS$.



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8. In a circle with centre 'O' chord $PQ \cong$ chord
RS

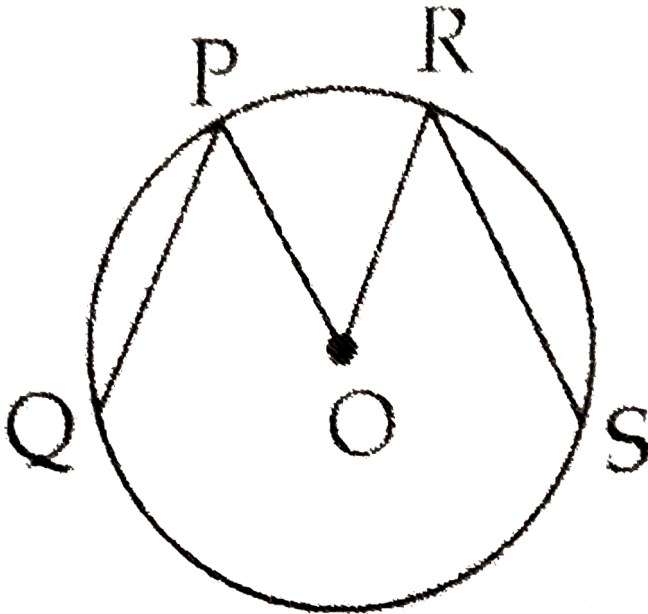
If $m \angle POR = 70^\circ$ and $m(\text{arc } RS) = 80^\circ$,

then find

(1) $m(\text{arc } PR)$

(2) $m(\text{arc } QSR)$

(3) $m(\text{arc } QS)$



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9. In the adjoining figure, $m(\text{arc } WY) = 44^\circ$ m

$(\text{arc } ZX) = 68^\circ$, then

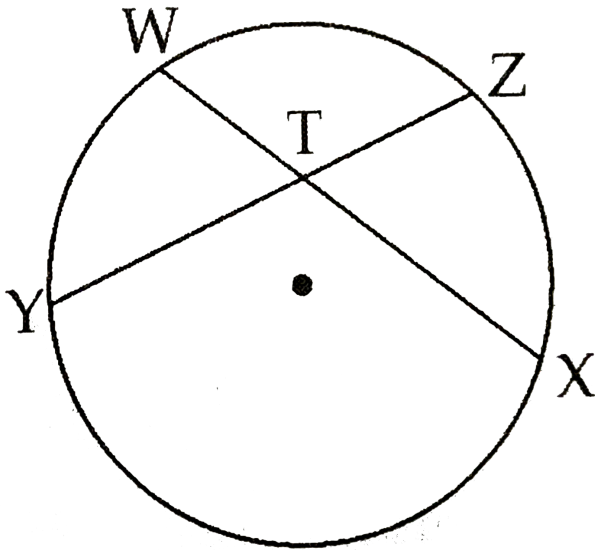
(i) Find $m \angle ZTX$.

(ii) If $l(WT) = 4.8$, $l(TX) = 8$ $l(YT) = 6.4$, then find

$l(TZ)$

(iii) If $l(WX) = 25$, $l(YT) = 8$ $l(YZ) = 26$, then find

I(WT)



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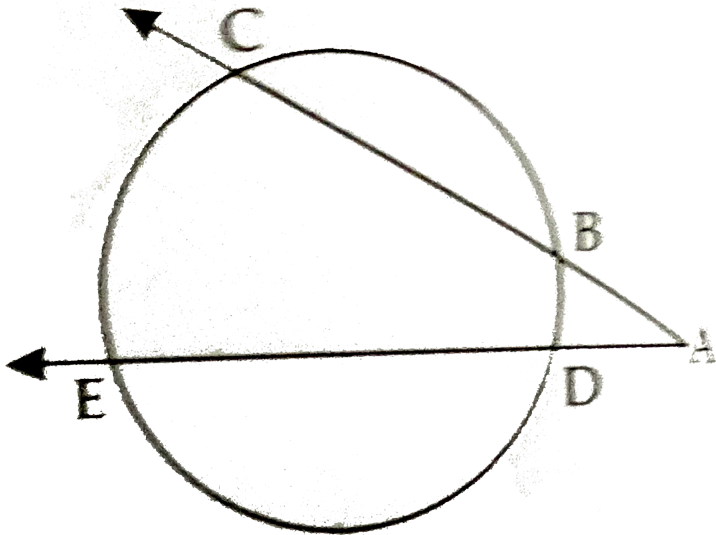
10. In the adjoining figure,

(i) if $m(\text{arc CE}) = 54^\circ$, $m(\text{arc BD}) = 23^\circ$, then

find $\angle CAE$.

(ii) If $AB = 4.2$, $BC = 5.4$, $AE = 12$, then find AD

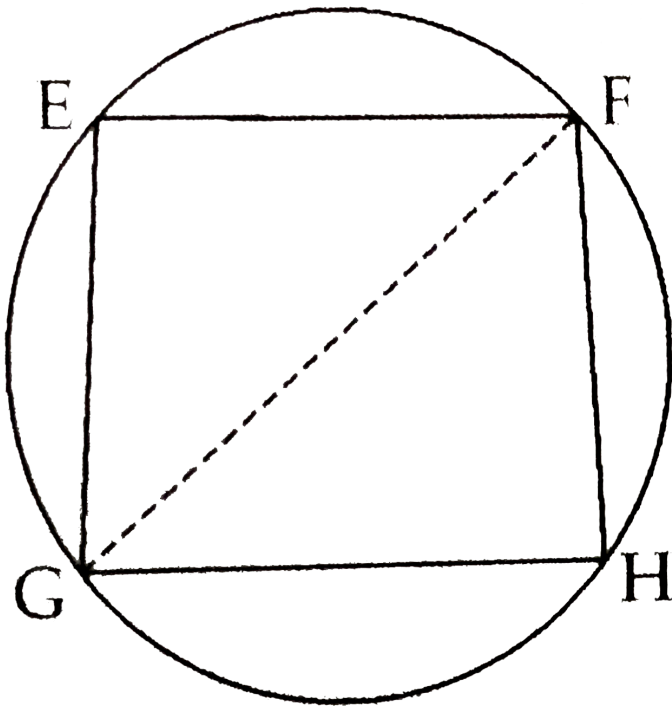
(iii) If $AB = 3.6$, $AC = 9.0$, $AD = 5.4$, then find AE .



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11. In the adjoining diagram, chord $EF \parallel$ chord GH . Prove that chord $EG \cong$ chord FE .

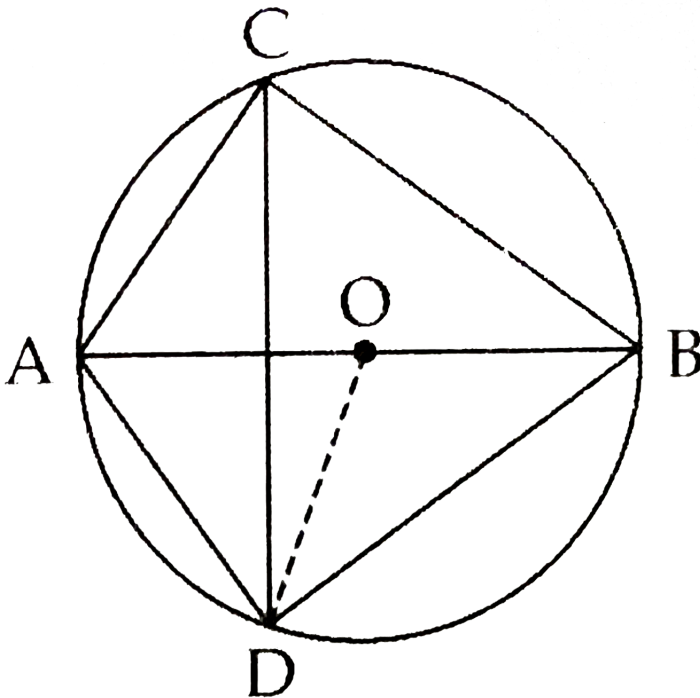
[Complete the following for the proof]



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12. In the adjoining figure, seg AB is a diameter of a circle with centre O . Bisector of inscribed $\angle ACB$ intersects circle at point D. Complete the following proof by filling in the blanks.

Prove that : seg AD \cong seg BD

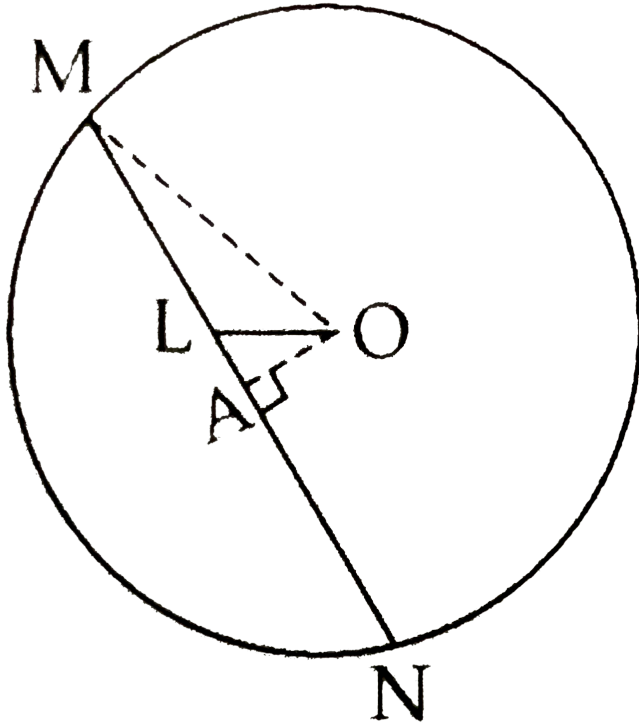




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13. In the adjoining figure, seg MN is a chord of a circle with centre O . $l(MN) = 25$. Point L on chord MN such that $l(MN)=9$ and $l(OL)= 5$, then

find radius of the circle.



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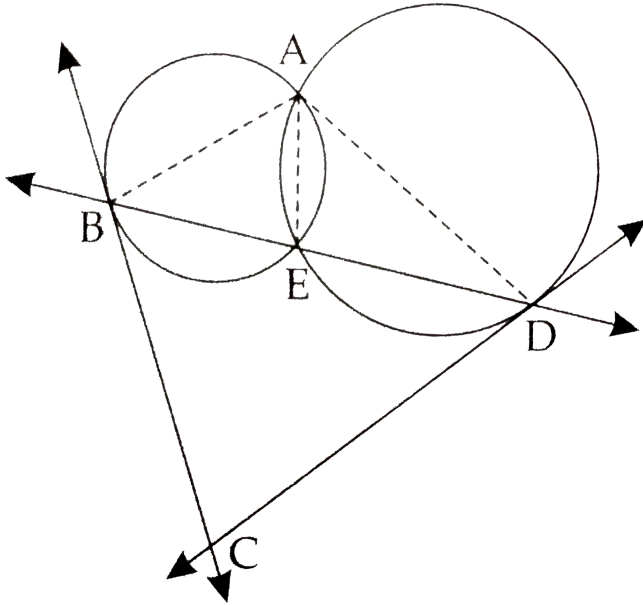
14. In the adjoining figure, two circles intersect each other at points M and N . Secants drawn from points M and N intersect circles at point R, S, P and Q as shown in the figure.



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

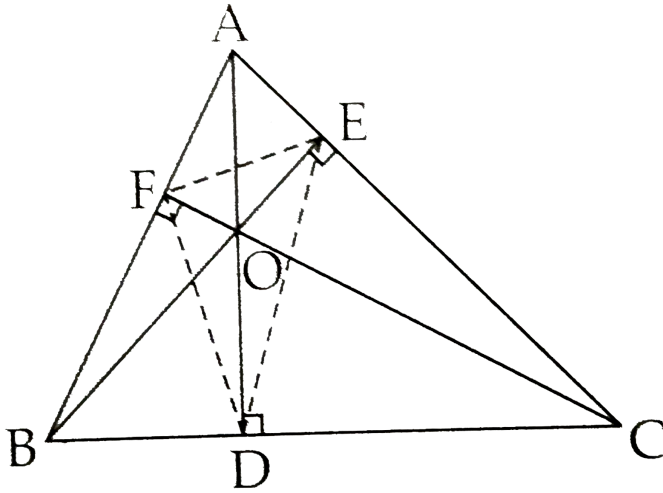
that $\square ABCD$ is cyclic .



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16. In the adjoining figure, $\text{seg } AD \perp \text{side } BC$,
 $\text{seg } BE \perp \text{side } AC$, $\text{seg } CF \perp \text{side } AB$. Point O
is the orthocentre. Prove that, point O is the

incentre of $\triangle DEF$



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Problem Set 3 Mcqs

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

A. 4.4 cm

B. 8.8cm

C. 2.2 cm

D. 8.8 or 2.2 cm

Answer: B::C



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2. Two circles 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. can't say

Answer: A::B::C



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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 distance 12.5 cm from the centre of a circle is 12 cm find 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 are touching externally, how many common tangents of them can be drawn ?

A. One

B. Two

C. Three

D. Four

Answer:



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

A. 65°

B. 130°

C. 295°

D. 230°

Answer: B::C



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

A. 7

B. 8

C. 11.2

D. 9

Answer: 7



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. 36

B. 72

C. 90

D. 108

Answer: B





9. Points A, B, C are on a circle, such that $m(\text{arc } AB) = m(\text{arc } BC) = 120^\circ$. No point, except point B, is common to arcs. Which is the type of $\triangle ABC$?

- A. Equilateral triangle
- B. Scalene triangle
- C. Right angled triangle
- D. Isosceles triangle

Answer: A



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10. Seg XY is a diameter of a circle . Point Z lies in its interior . How many of the following statements are true ?

- (i) It is not possible that $\angle XYZ$ is an acute angle.
- (ii) $\angle XYZ$ can't be a right angle.
- (iii) $\angle XYZ$ is an obtuse angle.

(iv) Can't make a definite statement for measure of $\angle XYZ$

A. Only one

B. Only two

C. Only three

D. All

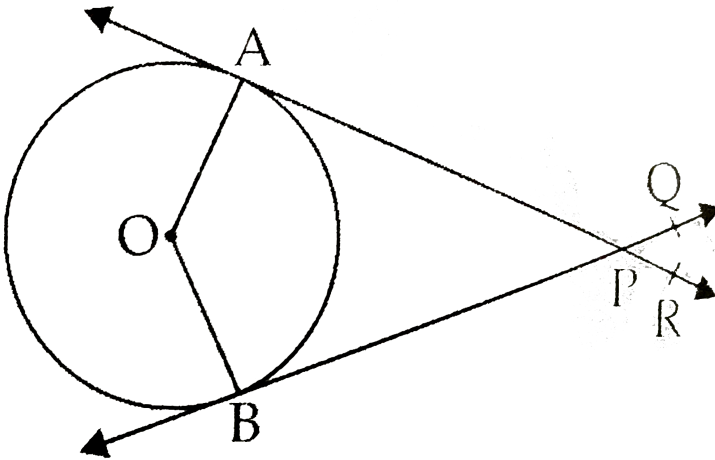
Answer:



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1. $\angle QPR = 60^\circ$

$\therefore \angle AOB = \dots\dots\dots$



A. 60°

B. 90°

C. 120°

D. 240°

Answer: C



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2. Angle between external end point of radius and tangent is

A. 90°

B. an acute angle

C. an obtuse angle

D. 45°

Answer:



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3. Point P is on the circle. AB is diameter of the circle, $\angle APB$ is

- A. a Reflex angle
- B. an acute angle
- C. a Right angle
- D. an obtuse angle

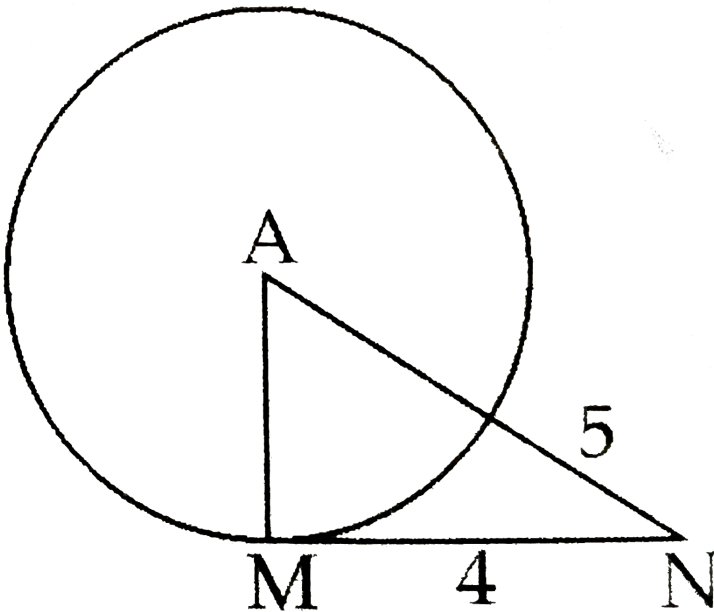
Answer: A



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4. MN is tangent at M and

AM is radius . Find AM.



A. 6

B. 3

C. $3\sqrt{3}$

D. 1

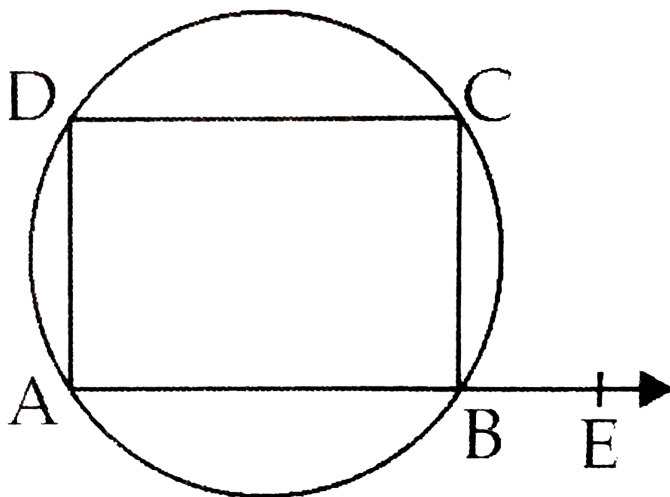
Answer: B



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5. $\angle ADC = 80^\circ$, then

$\angle CBE = ?$



A. 100°

B. 10°

C. 80°

D. 280°

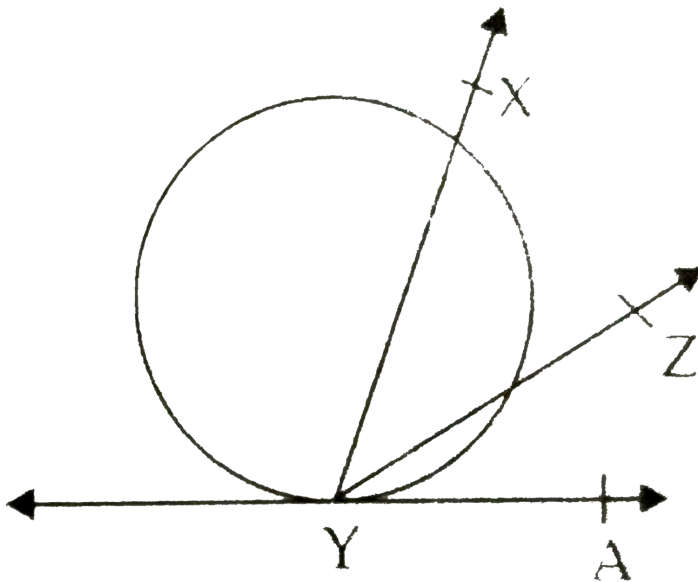
Answer:



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6. $\angle XYZ = 40^\circ$, $\angle AYZ = 20^\circ$ line Ay is tangent at point Y.

$\therefore m(\text{arc } XY) = \dots\dots$



A. 80°

B. 40°

C. 60°

D. 120°

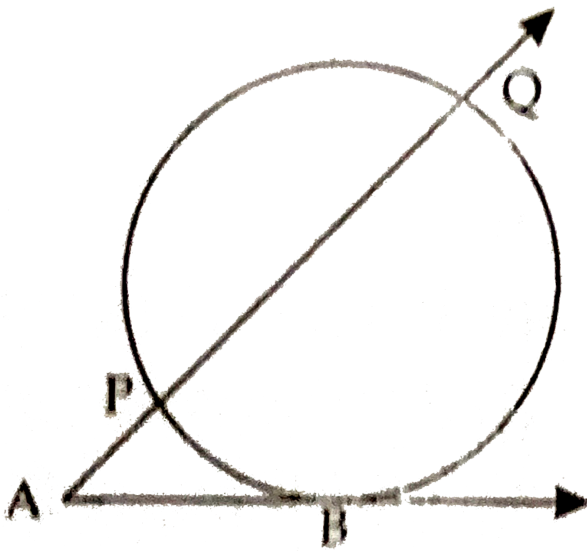
Answer: C



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7. AB is tangent at B. $AB = 12$, $AP = 6$

$\therefore PQ = \dots\dots$



A. 18

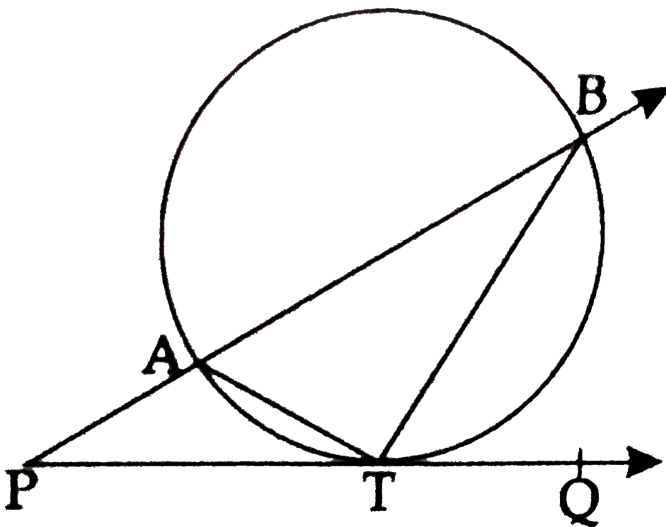
B. 6

C. 12

D. 20

Answer: A

8. Line PT is tangent at point T . Which of the following is true ?



A. $\angle ABT \cong \angle APT$

B. $\angle ABT \cong \angle BAT$

C. $\angle BAT \cong \angle BTQ$

D. None of (A), (B), (C)

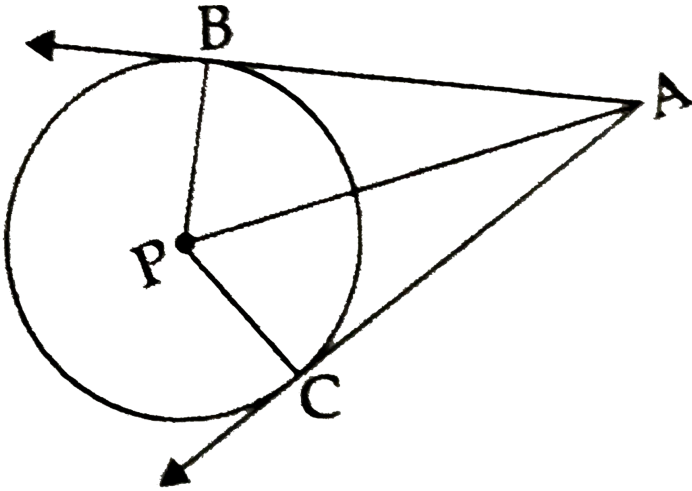
Answer: A::B



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9. A circle with centre P . Line AB and line AC are tangents from point A at points B and C respectively . Which of the following is/ are true

?



A. $\angle BPA \cong \angle CPA$

B. $\angle BAP \cong \angle CAP$

C. $\angle PBA \cong \angle PCA$

D. All of (A),(B), (C)

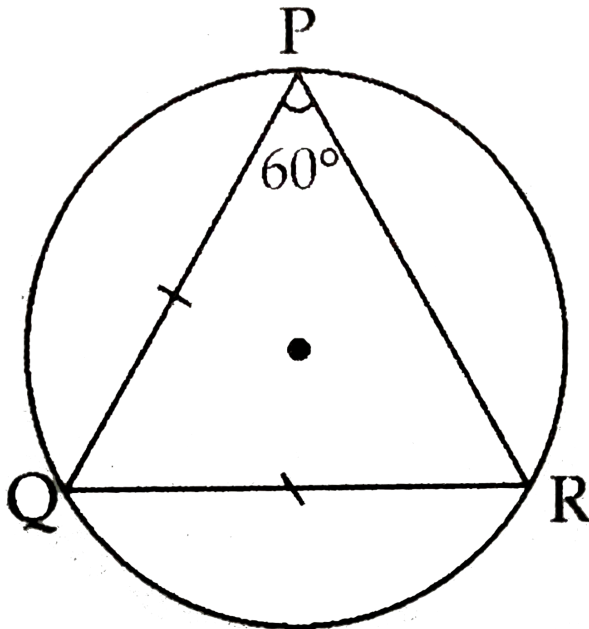
Answer: A::B::C::D



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10. In adjoining figure, $PQ = QR$. $\angle P = 60^\circ$

$\therefore m(\text{arc PR}) = \dots$



A. 120°

B. 60°

C. 90°

D. 240°

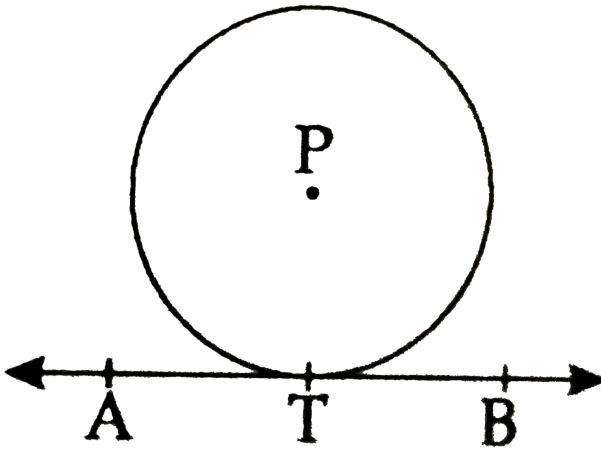
Answer: A



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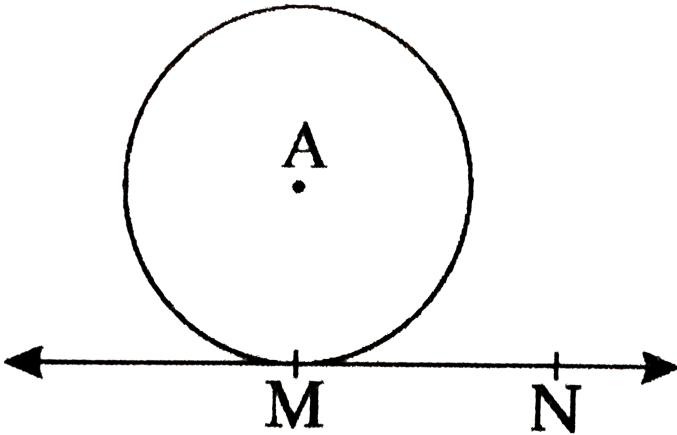
Problems For Practice Based On Parctice Set 3 1

1. In the adjoining figure, point P is the centre of the circle and line AB is the tangent to the circle at T. The radius of the circle is 6 cm. Find PB if $\angle TPB = 60^\circ$



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2. In the adjoining figure point A is the centre of the circle . AN = 10 cm . Line NM is tangent at M . MN = 5 cm . Find the radius .



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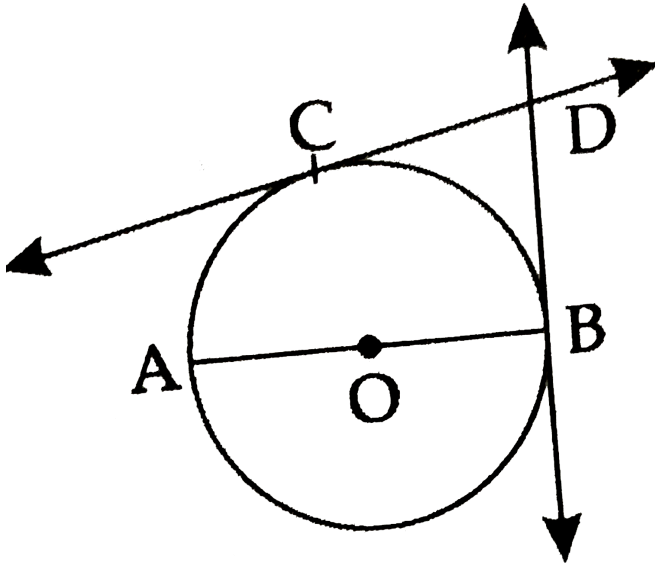
3. Two tangents TP and TQ are drawn to a circle with centre O from an external point T . Prove that $\angle PTQ = 2\angle OPQ$



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4. In the adjoining figure, O is the centre and seg AB is a diameter. At point C on the circle, the tangent CD is drawn. Line BD is tangent at

B . Prove that $\text{seg } OD \parallel \text{seg } AC$.



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Problems For Practice Based On Parctice Set 3 2

1. Two circles of radii 5 cm and 3 cm touch externally . Find the distance between them.



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2. Find the distance between two internally touching circles whose radii are 10 cm and 2 cm.



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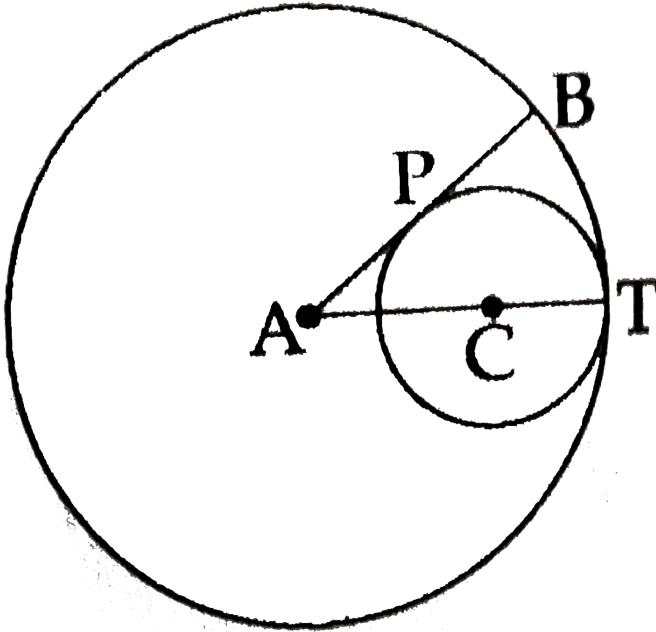
3. The circles which are not congruent touch externally. The sum of their areas is $130\pi\text{cm}^2$ and distance between their centres is 14 cm . Find the radii of the two circles.



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4. In the adjoining figure circles with centres A and C touch internally at point T . Line AB is tangent to the smaller circle at point P . Point B lies on the bigger circle. Radii are 16 cm and 6

cm . Find AP.



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5. The radii of two circles are 25 cm and 9 cm .
The distance between their centres is 34 cm .

Find the length of the common tangent segment to these circles .

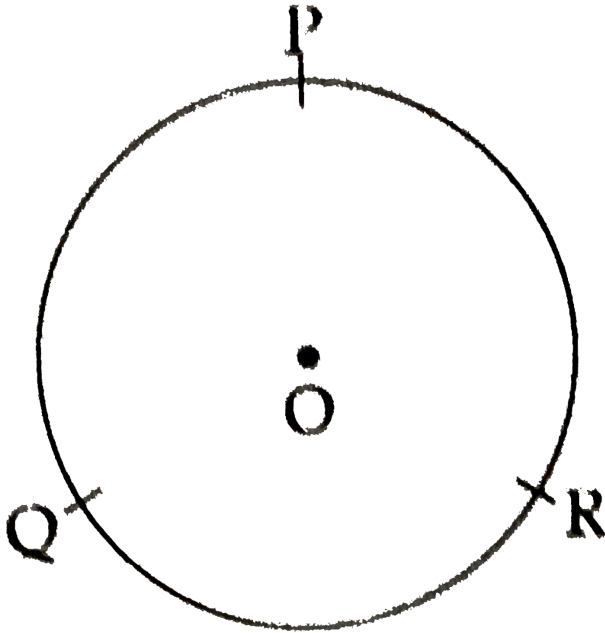


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Problems For Practice Based On Parctice Set 3 3

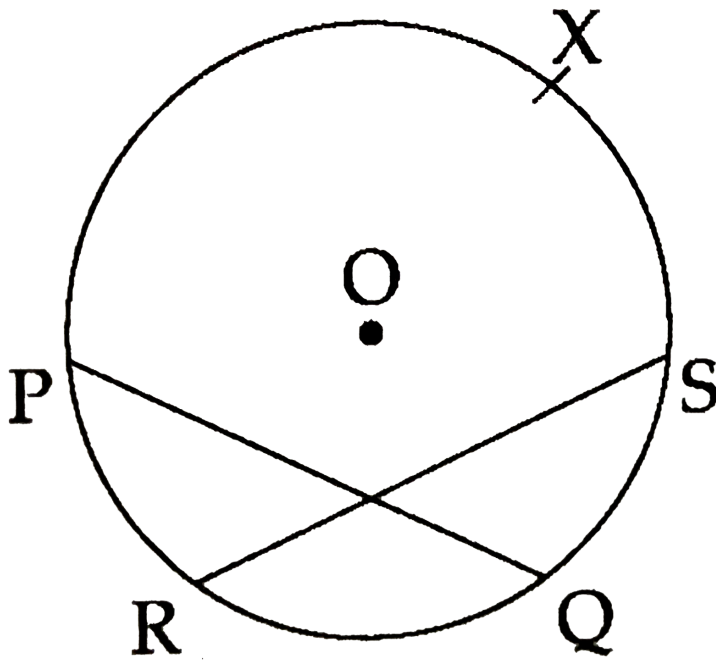
1. In the adjoining figure, a circle with centre 'O' are $PQ = \text{arc } QR = \text{arc } PR$. Find measure of each

arc



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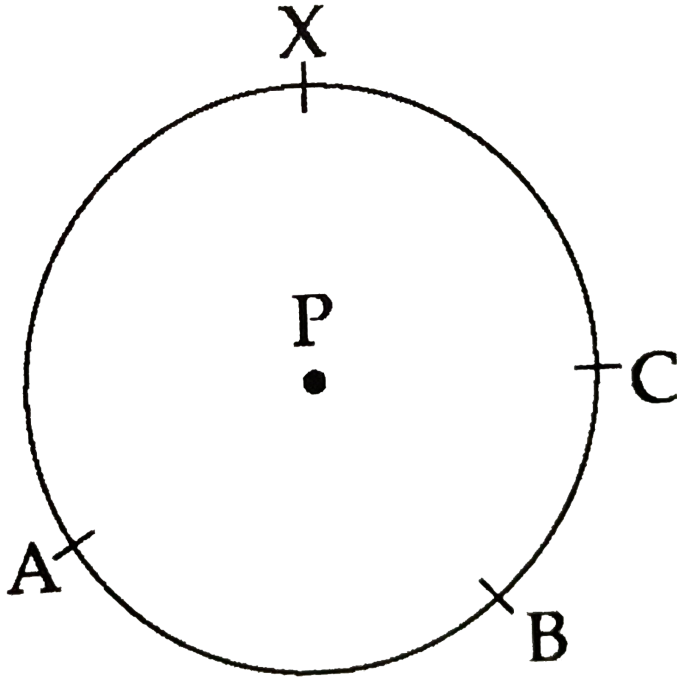
2. A circle with centre 'O' . Chord $PQ \cong$ chord RS . $m(\text{arc } PXQ) = 260^\circ$. Then find $m(\text{arc } RXS)$.



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3. A circle with centre P. arc $AB = \text{arc } BC$ and arc $AXC = 2 \text{ arc } AB$. Find measure of arc AB , arc BC

and arc AXC . Prove that chord $AB \cong$ chord BC

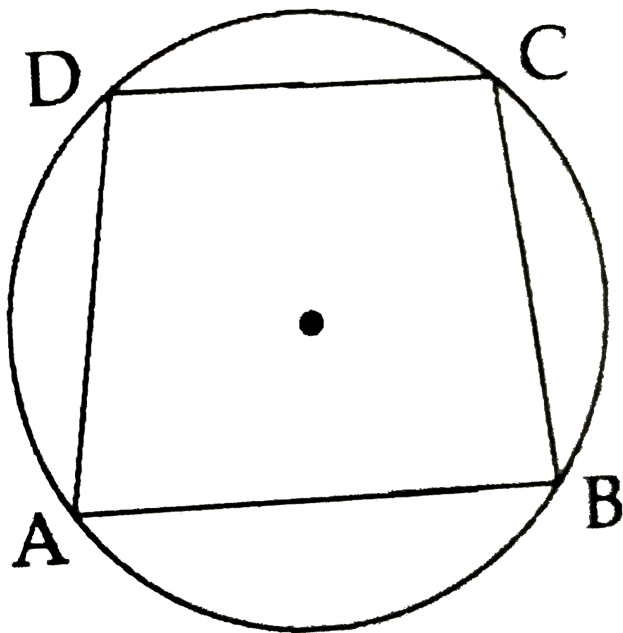


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4. In the adjoining figure, chord $AD \cong$ chord

BC . $m(\text{arc } ADC) = 100^\circ$ $m(\text{arc } CD) = 60^\circ$.

Find $m(\text{arc } AB)$ and $m(\text{arc } BC)$.

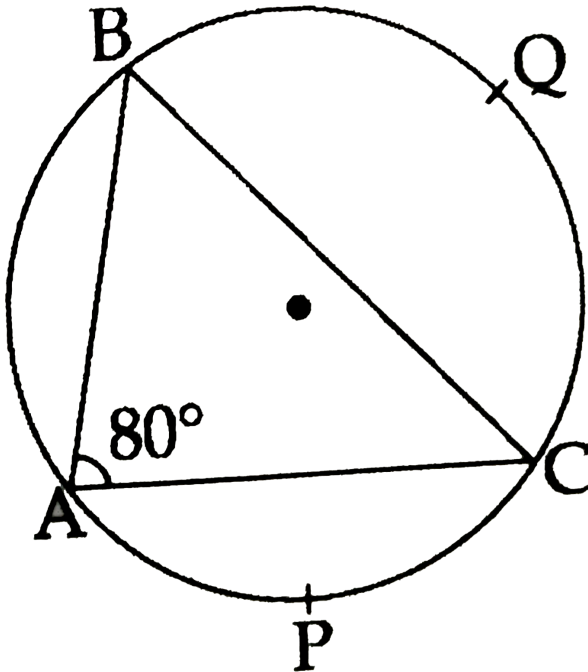


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Problems For Practice Based On Parctice Set 3 4

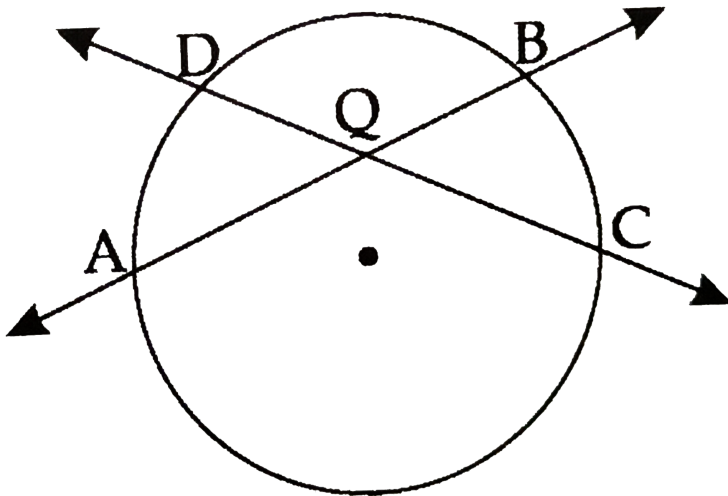
1. If $m(\text{arc APC}) = 60^\circ$ and $\angle BAC = 80^\circ$. Find

(a) $\angle ABC$ (b) $m(\text{arc BQC})$



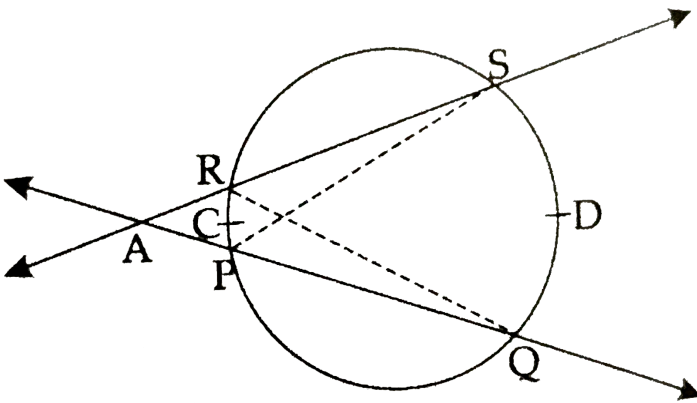
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2. chords AB and CD of a circle intersect in point Q in the interior of a circle of a shown in the figure. If $m(\text{arc AD}) = 20^\circ$, and $m(\text{ARC BC}) = 36^\circ$ then find $\angle BQC$



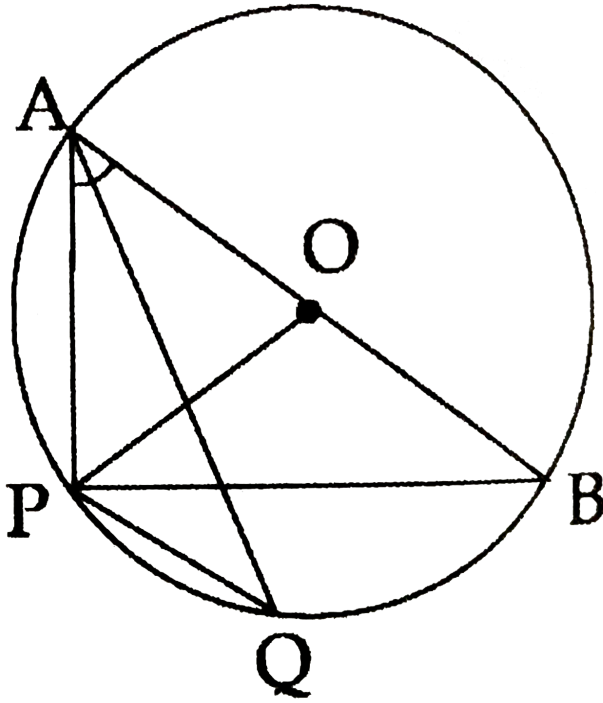
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3. Secants containing chords RS and PQ of a circle intersect each other in point A in the exterior of a circle. If $m(\text{arc PCR}) = 26^\circ$ $m(\text{arc QDS}) = 48^\circ$, then find (1) $\angle AQR$ (2) $\angle SPQ$ (3) $\angle RAQ$.



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4. In the adjoining figure, O is the centre of the circle . Find the value of $\angle ABP$ if $\angle POB = 90^\circ$



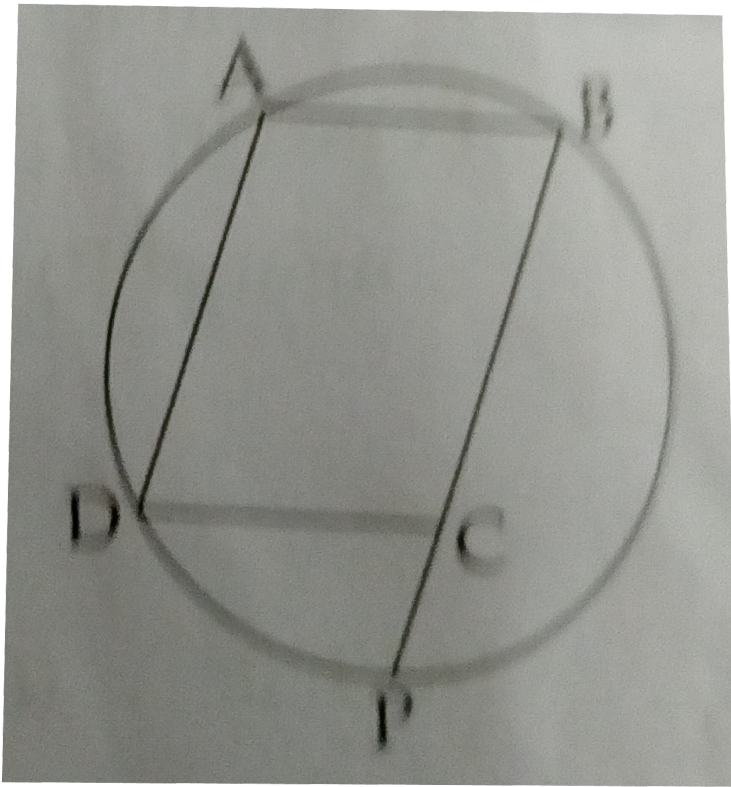
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5. If two consecutive angles of cyclic quadrilateral are congruent, then prove that one pair of opposite sides is congruent and other is parallel.



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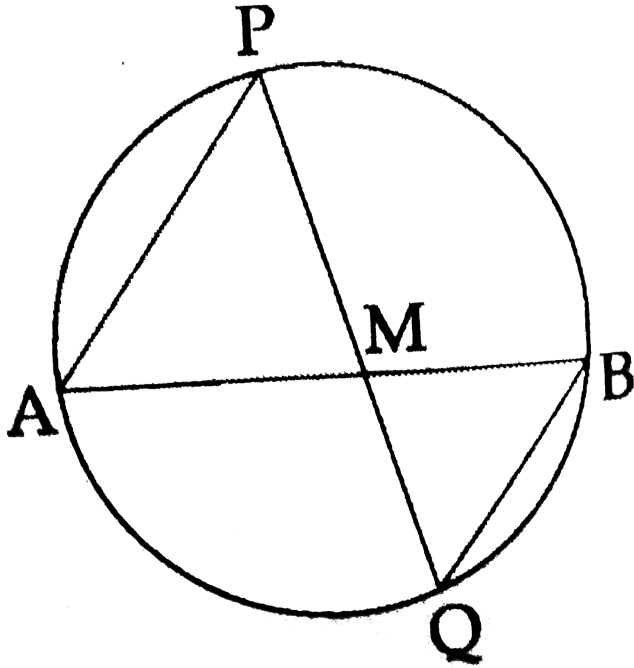
6. $\square ABCD$ is a parallelogram . Side BC intersects circle at point P . Prove that $DC = DP$.



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7. In the adjoining figure, chord Pq and chord AB intersect at point M . If $PM = AM$, then prove

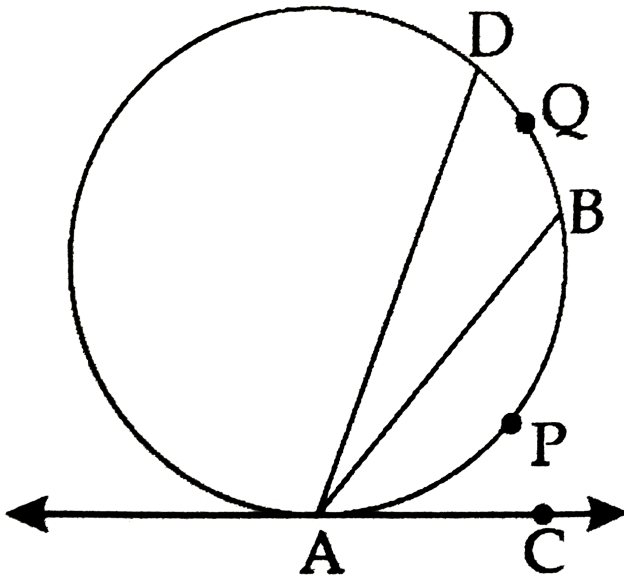
that $BM = QM$.



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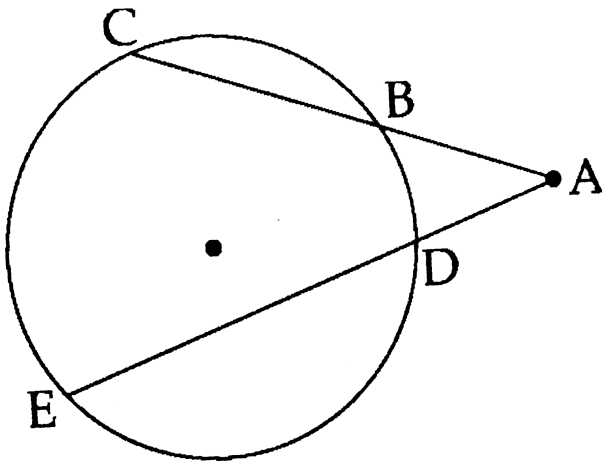
Problems For Practice Based On Parctice Set 3 5

1. Seg AB and seg AD are the chords of the circle . C is a point on tangent of the circle at point A . If $m(\text{arc APB}) = 80^\circ$ and $\angle BAD = 30^\circ$ The find (i) $\angle BAC$ (ii) $m(\text{arc BQD})$.



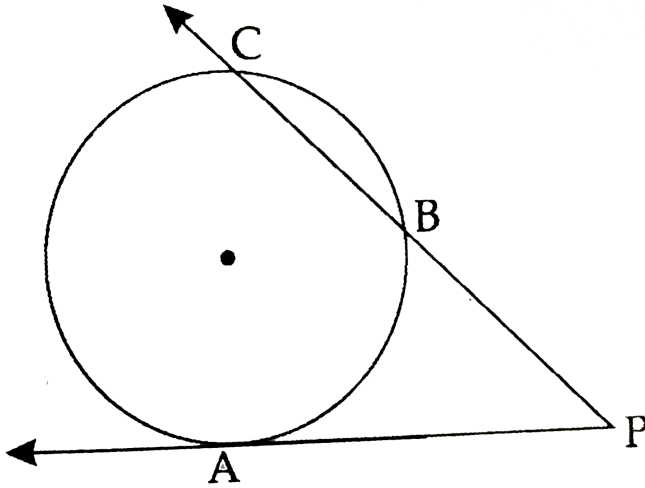
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2. Secant AC and secant AE intersect in point A . Points of intersections of the circle and secants are B and D respectively . If $CB = 5$, $AB = 7$, $EA = 20$. Determine $ED - AD$



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3. In the adjoining figure line PA is tangent at point A . Line PBC is a secant . If $AP = 15$ and $BP = 10$, find BC.



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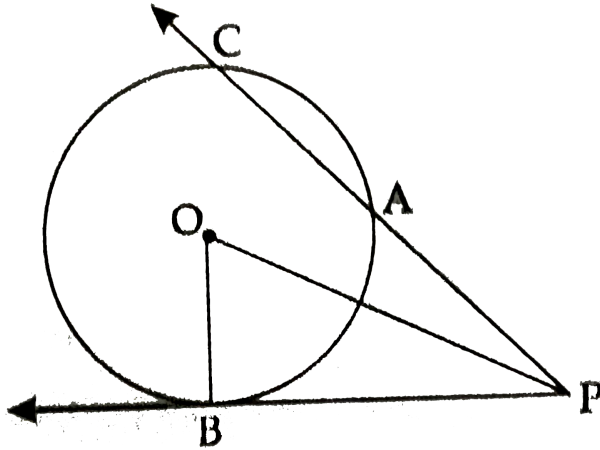
4. $\square ABCD$ is a rectangle. Taking AD as a diameter, a semicircle AXD is drawn which intersects the diagonal BD at X . If AB = 12 cm, AD = 9 cm , then find values of BD and BX.



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5. In the adjoining figure point O is the centre of the circle . Line PB is a tangent and line PAC is a secant. Find $PA \times PC$ if $OP = 25$ and radius is

7.



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Assignment 3 A Solve The Following Sub Questions

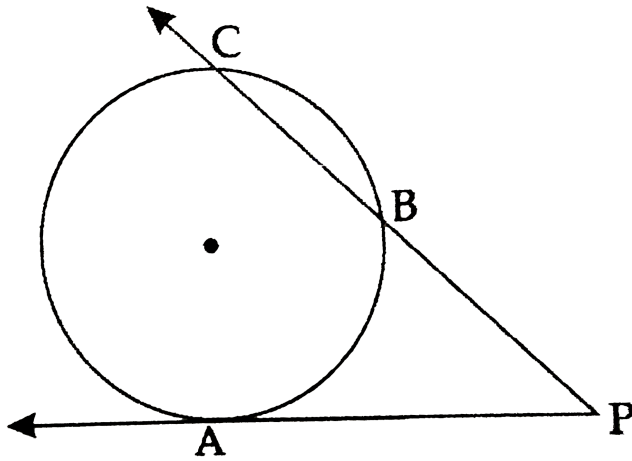
1. Two circles with diameters 6 cm and 9 cm touch each other externally. Find the distance between their centres.



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Assignment 3 B Solve Any One Of The Following Questions

1. Line PA is a tangent at point A. Line PBC is a secant $AP = 15$, $BP = 10$, find BC.



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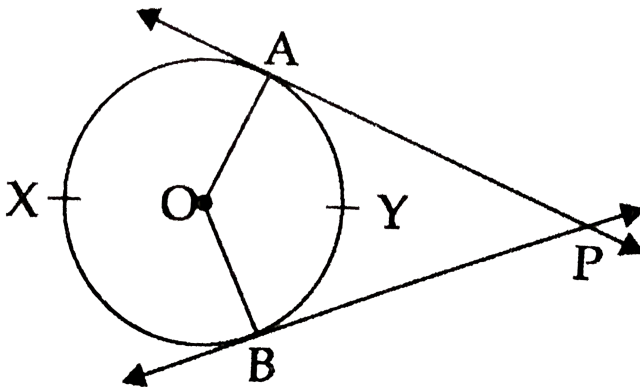
Assignment 3 Solve Any One Of The Following Questions

1. Measure of a major arc of a circle is four times the measure of corresponding minor arc.

Find the measure of each arc.

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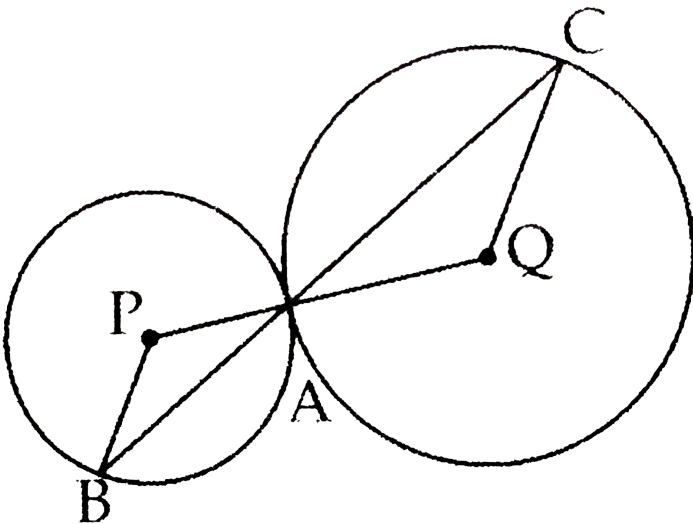
2. Line PA and line PB are tangents to the circle at points A and B. If $\angle APB = 60^\circ$ then find $m(\text{arc } AXB)$.



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Assignment 3 Solve The Following Sub Questions Any Two

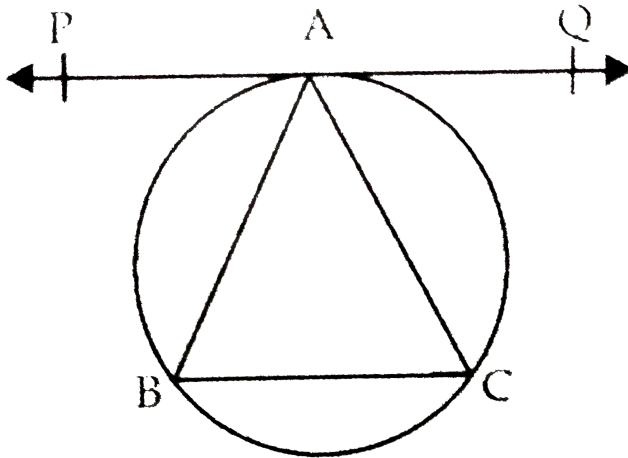
1. Two circles with centres P and Q touch each other at point A. $\angle BPA = 60^\circ$. Find $\angle QCA$ and $\angle CQP$





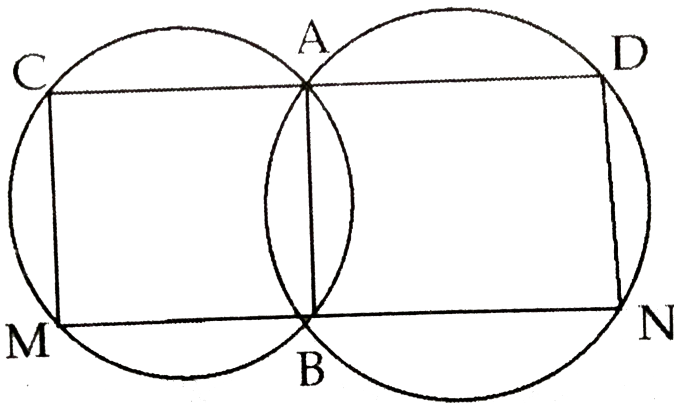
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2. Line PQ is a tangent to the circle at point A
 \cong arc AC . Complete the following activity to
prove $\triangle ABC$ as isosceles triangle.



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3. Two circles intersect each other in point A and B . Secants through A and B intersect circles in C, D and M, N as shown in the figure
prove that : $CM \parallel DN$

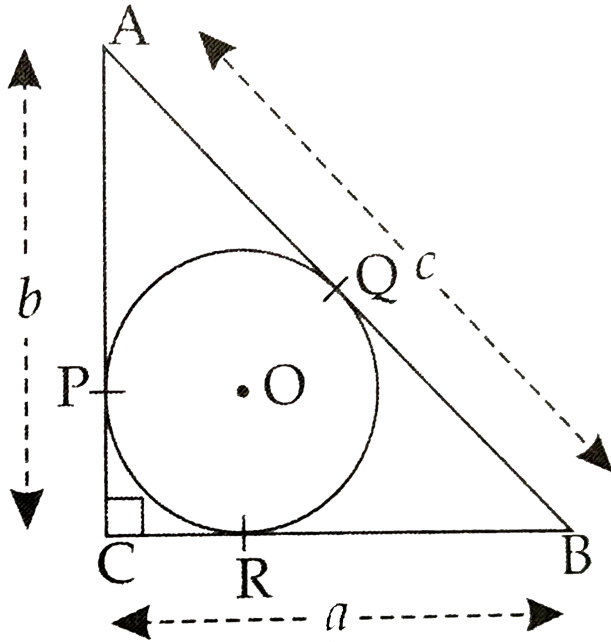


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Assignment 3 Solve Any Two Of The Following Questions

1. A circle with centre 'O' is incircle of ΔABC . $\angle C = 90^\circ$. Radius of the circle is r.

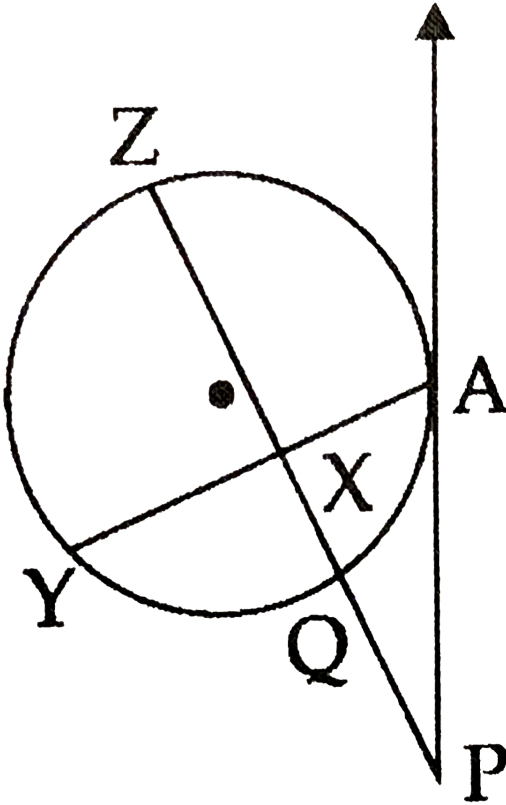
Prove that : $2r = a + b - c$.



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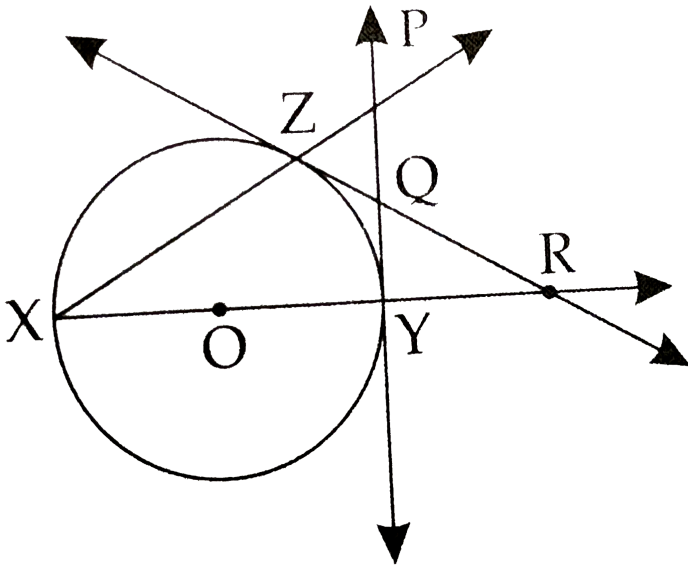
2. In the adjoining figure line PA is a tangent to the circle at point A . Secant PQZ intersects

chord AY in point X , such that $AP = PX = XY$. If $PQ = 1$ and $QZ = 8$. Find AX .



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3. In the adjoining figure, O is the centre of the circle XY is a diameter. $OY = YR$, O-Y-R, RZ is a tangent through Z. A tangent through the point Y intersects RZ in Q and XZ in P. prove that : $\triangle PQZ$ is an equilateral triangle.



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