



MATHS

BOOKS - CHETANA MATHS (MARATHI ENGLISH)

CIRCLE

Example

1. If radius of a circle is 4.3 cm, then find length of longest chord.



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2. If circumcentre of a triangle is outside the triangle, then what is the type of triangle?



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3. A circle passes through 3 vertices of a triangle. What is the centre of the circle called?



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4. Radius of a circle is 3.05 cm, then diameter =...cm.



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5. Two circles with $r_1 = 6.3\text{cm}$ and $r_2 = 3.7\text{cm}$ touch externally.

What is the distance between their centres?



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6. What is ratio of circumcircle radius and radius of incircle of equilateral triangle?



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7. Name the circle which passes through three vertices of a triangle.



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8. What is incircle of a triangle?



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9. Circles with different radii but same centre are called.....



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10. For circle with centre O , radius is 10cm .
 $OM \perp AB$ where $OM = 8\text{cm}$ and AB is chord. Find chord AB .



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11. Find radius of a circle with chord $AB = 12\text{cm}$. Distance between chord and centre is 8cm .



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12. Draw circle with diameter 8 cm.



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13. Distance of chord PQ from centre of a circle is 11cm , $PQ = 120\text{cm}$. Find diameter of circle.



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14. Find area of circle whose diameter is 14 cm .



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15. Prove that, "If chords of congruent circles subtend equal angles at their centre, then the chords are equal."



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16. Chord of circle is 24 cms. It is at a distance of 5 cm from centre. Find radius.



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17. Draw circumcircle of an equilateral triangle.



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18. Distance of chord from centre is 8 cm.

Length of chord is 30 cm. Find radius of circle.

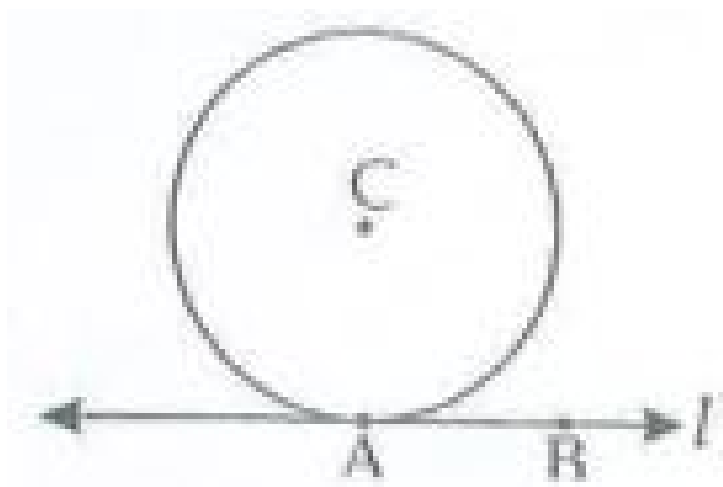


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19. In the adjoining figure, the radius of a circle

with centre C is 6 cm. Line AB is a tangent at

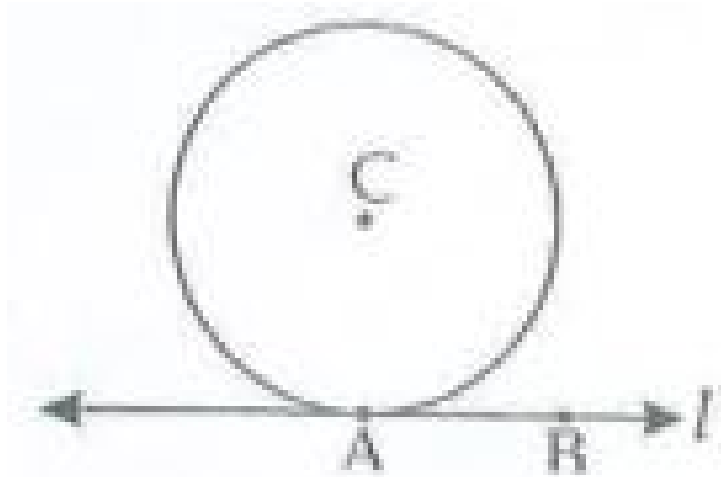
A. Answer the following questions. (i) What is the measure of $\angle CAB$? why?



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20. In the adjoining figure, the radius of a circle with centre C is 6 cm. Line AB is a tangent at A. What is the distance of point C

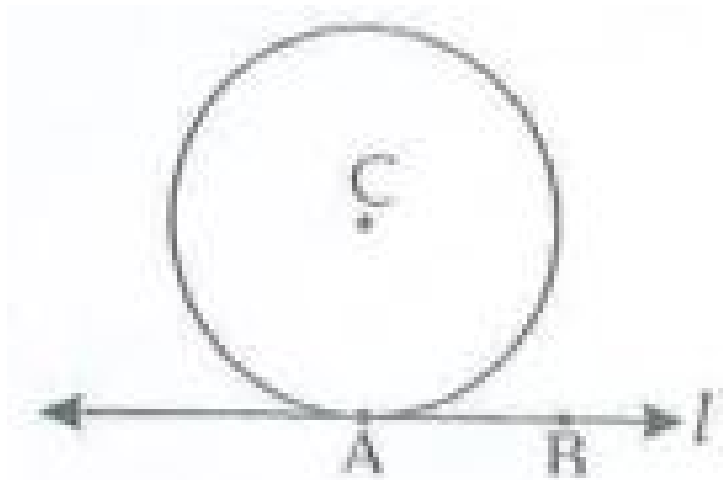
from line AB?



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

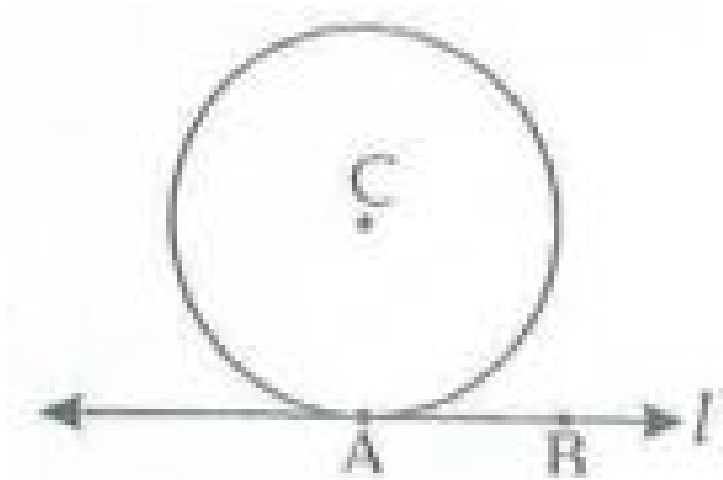
$d(A,B)=6$ cm, find $d(B,C)$.



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22. In the adjoining figure, the radius of a circle with centre C is 6 cm. Line AB is a tangent at A . What the measure of $\angle CAB$?

Why?



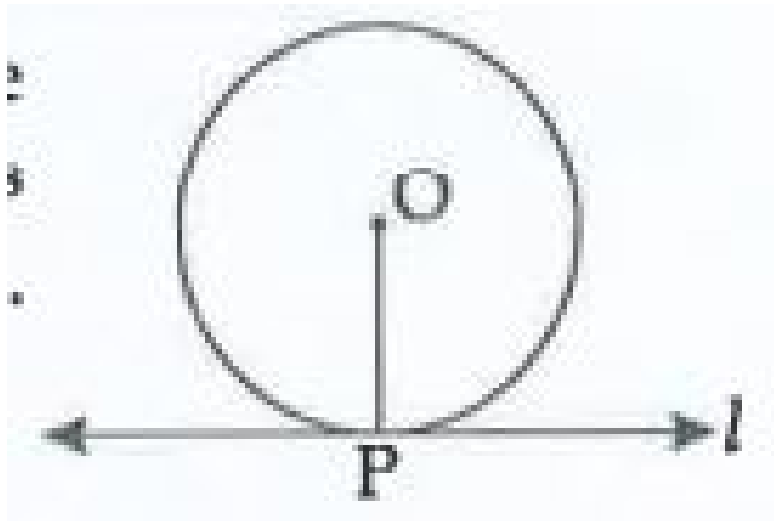
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23. What is the distance between two parallel tangents of a circle having radius 4.5 cm. Justify your answer.



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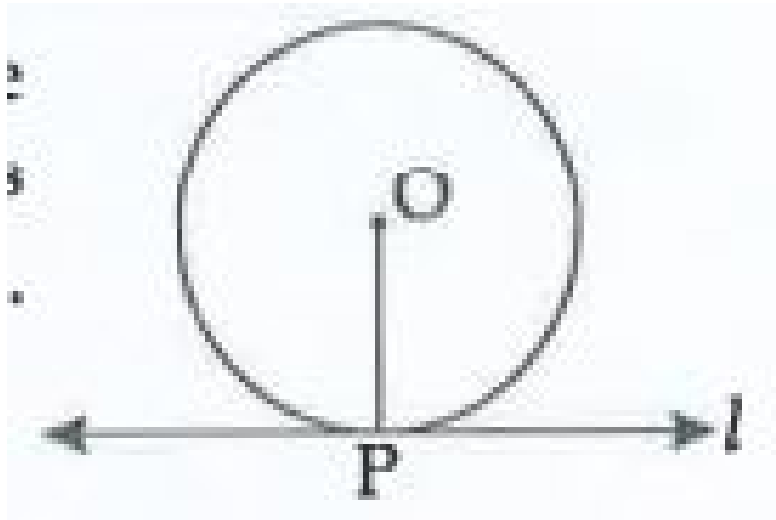
24. Line l touches the circle with centre O at P , radius of the circle is 9 cm. Answer the following. (i) What is $d(O, P)$



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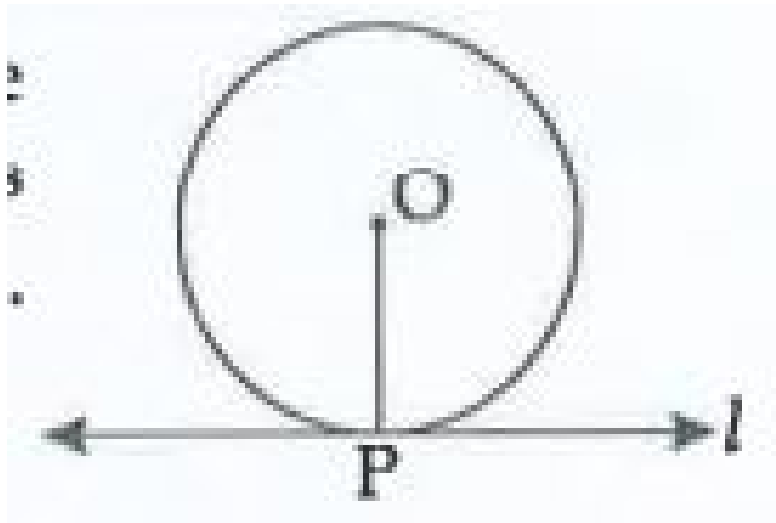
25. Line l touches the circle with centre O at P , radius of the circle is 9 cm. $d(O,Q)=8$ cm .

Where does the point Q lie?



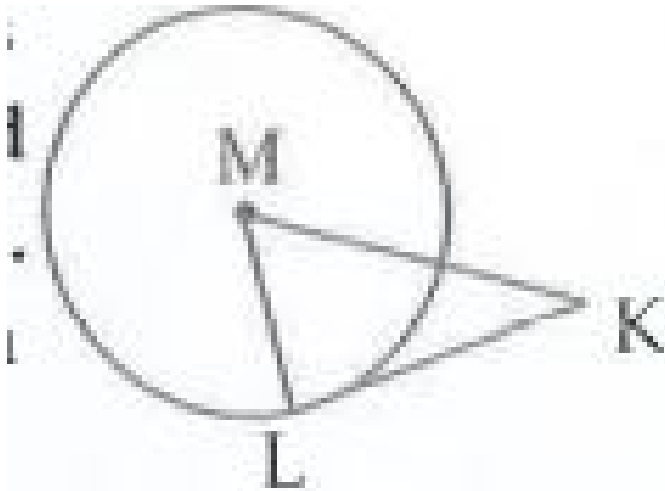
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26. Line l touches the circle with centre O at P , radius of the circle is 9 cm. $d(O,R)=15$ cm. Then how many locations of point R are there on line l ? At what distance will each of them be from point P ?



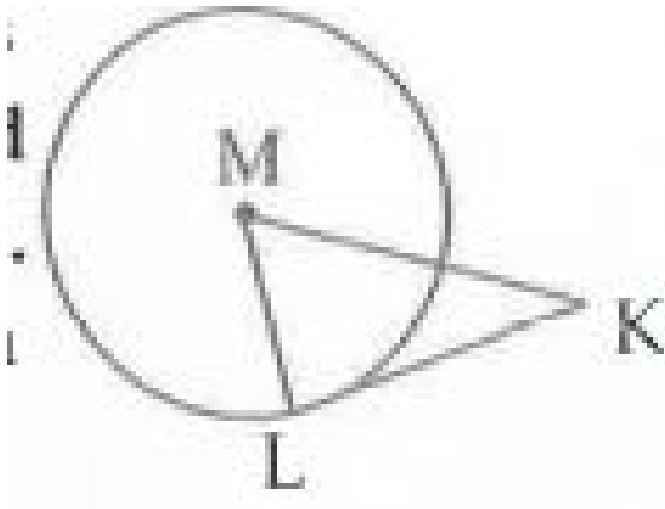
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27. In the adjoining figure, M is the centre of the circle and seg KL is a tangent. If $MK=12$, $KL = 6\sqrt{3}$, then find the radius of the circle.



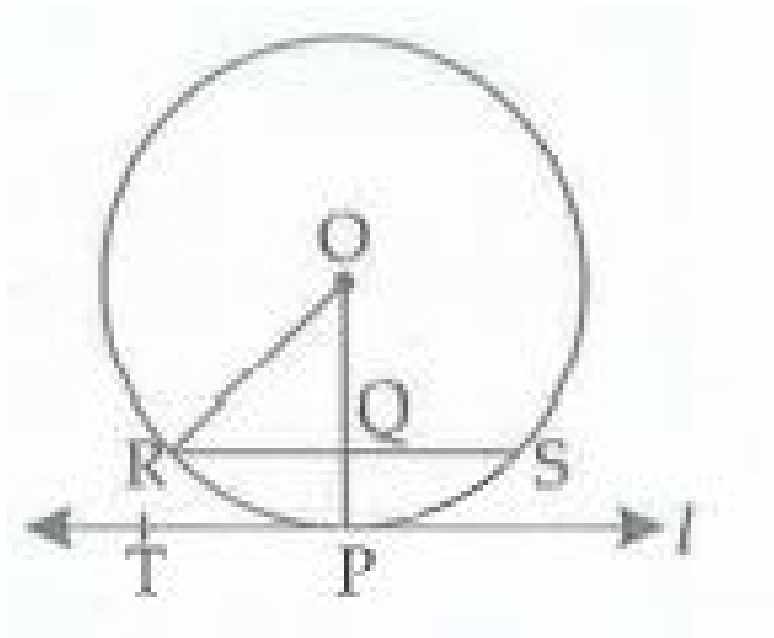
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28. In the adjoining figure, M is the centre of the circle and seg KL is a tangent. If $MK=12$, $KL = 6\sqrt{3}$, then find measure of $\angle K$ and $\angle M$



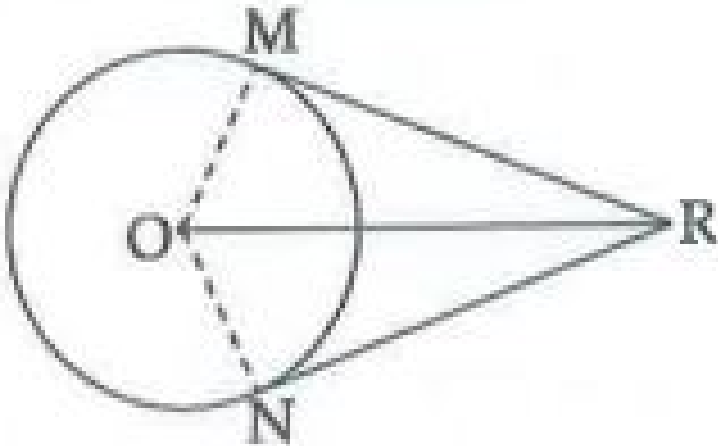
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29. In the adjoining figure, line l touches the circle at P . O is the centre. Q is the mid point of radius OP . Chord $RS \perp OP$ at Q . $RS = 12$, find radius of the circle.



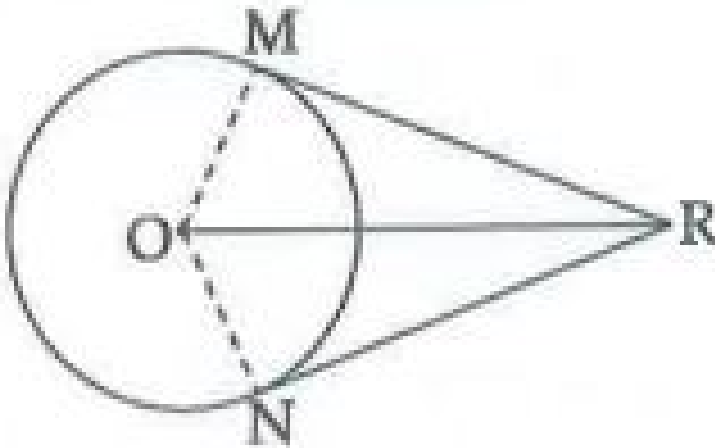
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30. In the adjoining figure, O is the centre of the circle. From point R , seg RM and RN are tangent segments drawn which touch the circle at M , N . If $OR=10$ cm, radius of the circle $=5$ cm, then find the length of each tangent segment.



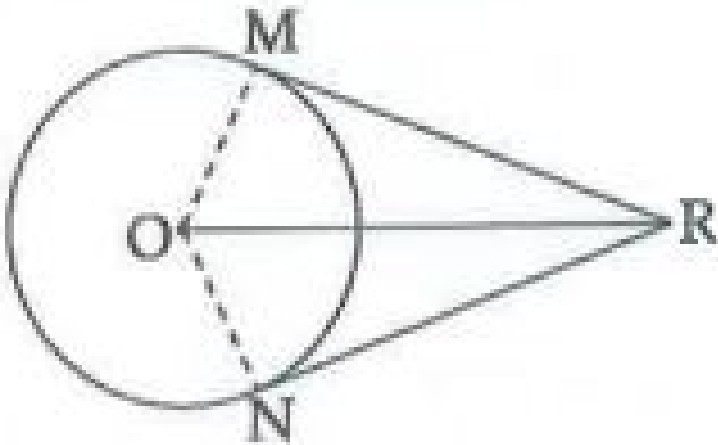
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31. In the adjoining figure, O is the centre of the circle. From point R , seg RM and RN are tangent segments drawn which touch the circle at M , N . If $OR=10$ cm, radius of the circle $=5$ cm, then find $m\angle MRO$



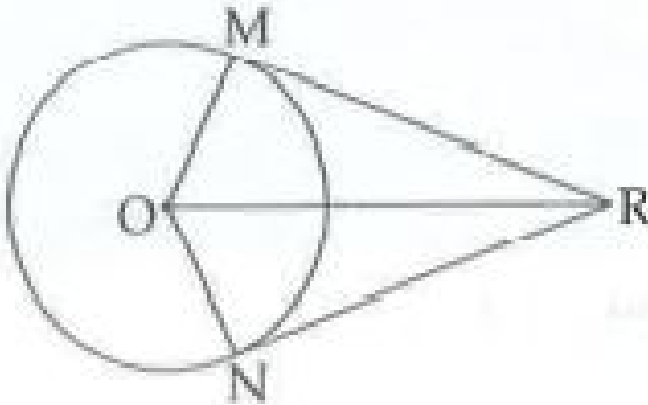
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32. In the adjoining figure, O is the centre of the circle. From point R , seg RM and RN are tangent segments drawn which touch the circle at M , N . If $OR=10$ cm, radius of the circle=5 cm, then find $m\angle MRN$



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33. 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 $\angle MON$.



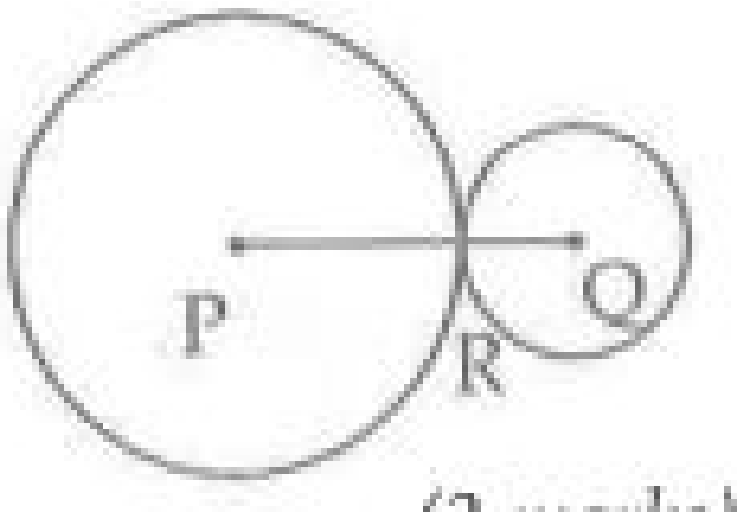
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34. Two circles having radii 3.5 cm and 4.8 cm touch each other internally. Find the distance between their centres.



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35. Two circles having radii 5.5 cm, 4.2 cm touch each other externally. Find distance between their centres?



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



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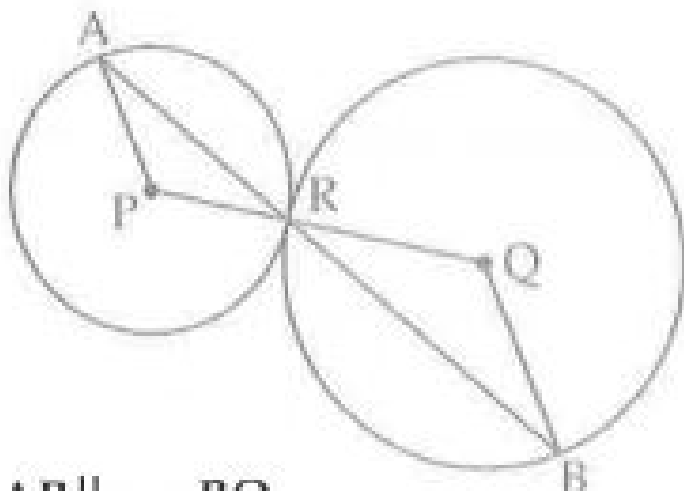
37. Draw circles with centers A,B,C each with radius 3 cm such that each circle touches the remaining two circles.



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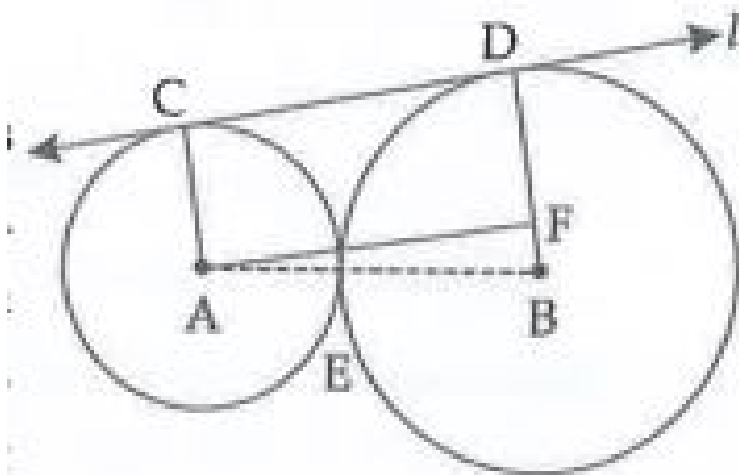
38. In the adjoining figure, the circles with centres P and Q touch each other at R. A line passing through R meets the circles A and B respectively then, Prove that (i)

$$\text{Seg}AP \parallel \text{seg}BQ$$



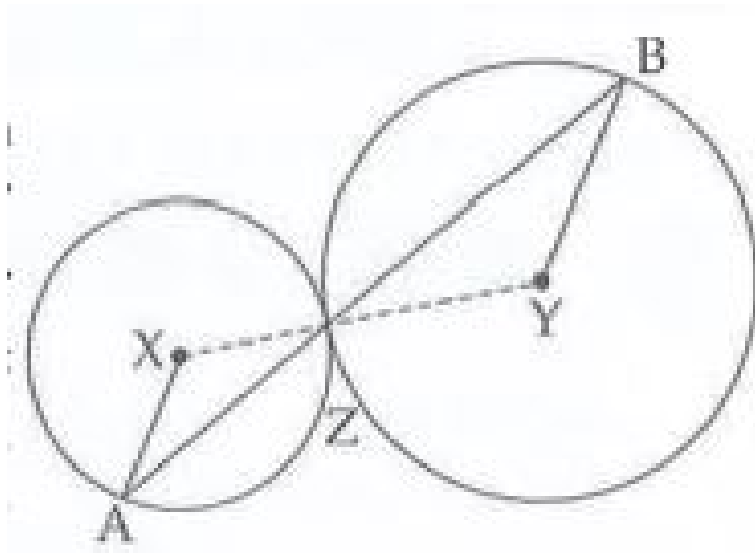
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39. In the adjoining figure, the circles with centre A and B touch each other at E. Line l is a common tangent that touches the circle at C and D respectively. Find length of seg CD if the radii of the circles are 4 cm, 6 cm?



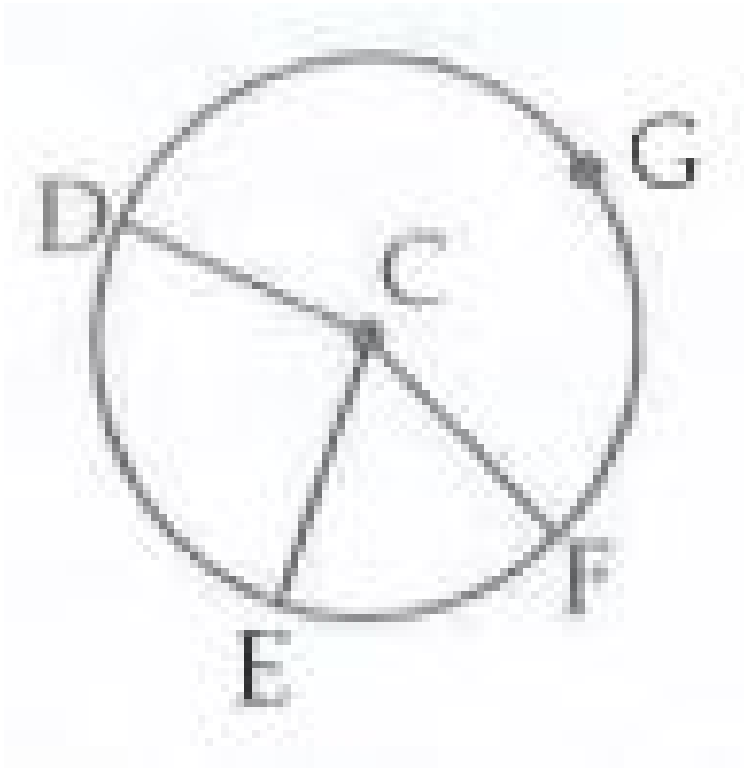
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40. In the adjoining figure, circles with centres X, Y touch each other at Z . A secant passing through Z meets the circles at A and B respectively. Prove that, $radius\ XA \parallel radius\ YB$. Fill in the blanks and complete the proof.



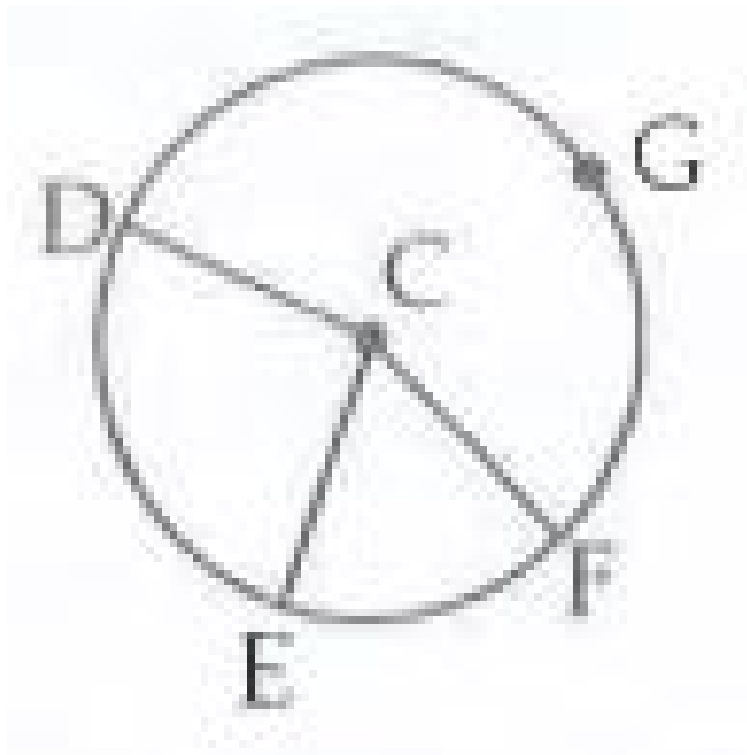
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41. In the adjoining figure, G,D,E,F are concyclic points of a circle with centre C. $\angle ECF = 70^\circ$, $m(\text{arc} DGF) = 200^\circ$ find (i) m arc DE.



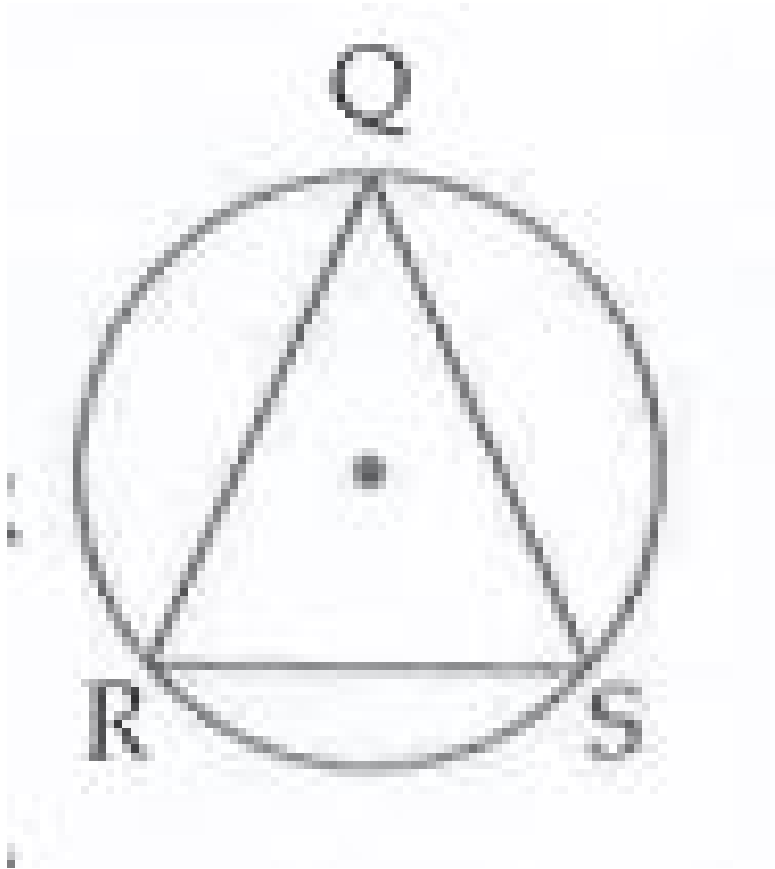
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42. In the adjoining figure, G,D,E,F are concyclic points of a circle with centre C. $\angle ECF = 70^\circ$, $m(\text{arc } DGF) = 200^\circ$ find $m(\text{arc } DEF)$.



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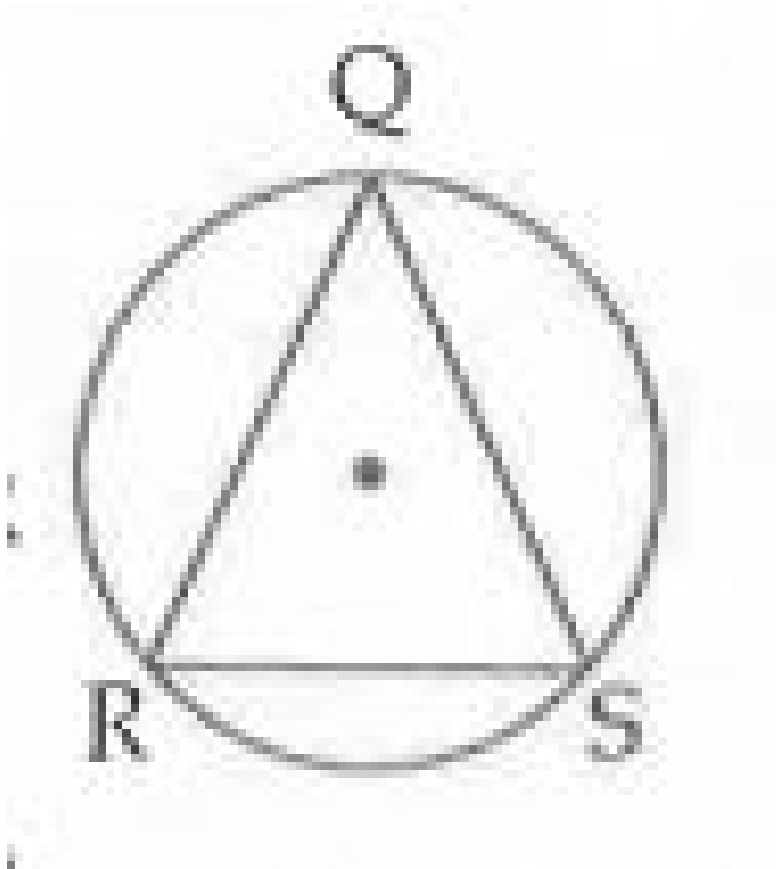
43. In the adjoining figure, $\triangle QRS$ is an equilateral triangle. Prove that $\text{arc}RS \cong \text{arc}QS \cong \text{arc}QR$



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

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



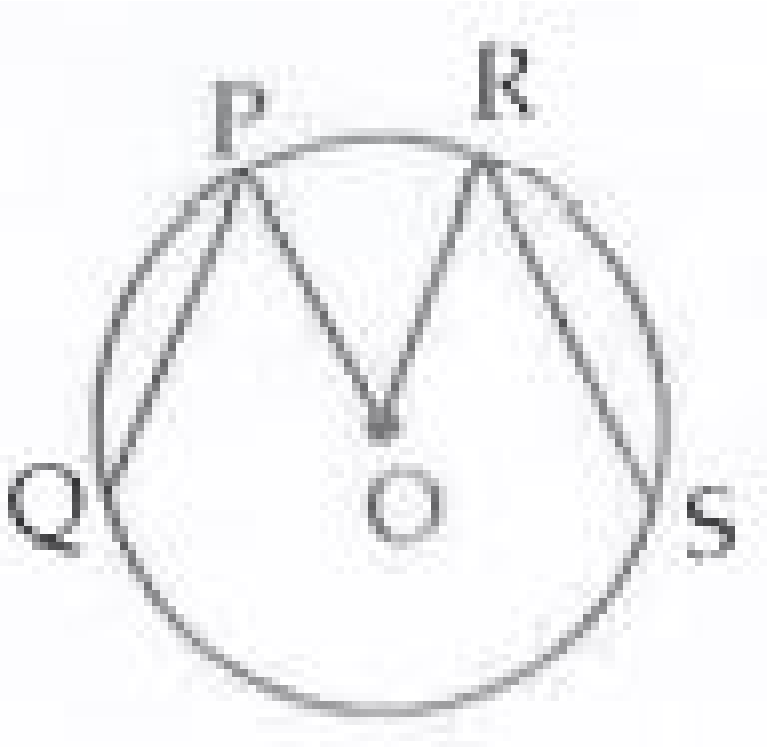
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45. In the adjoining figure, $AB \cong CD$. Prove that $\text{arc}AC \cong \text{arc}BD$



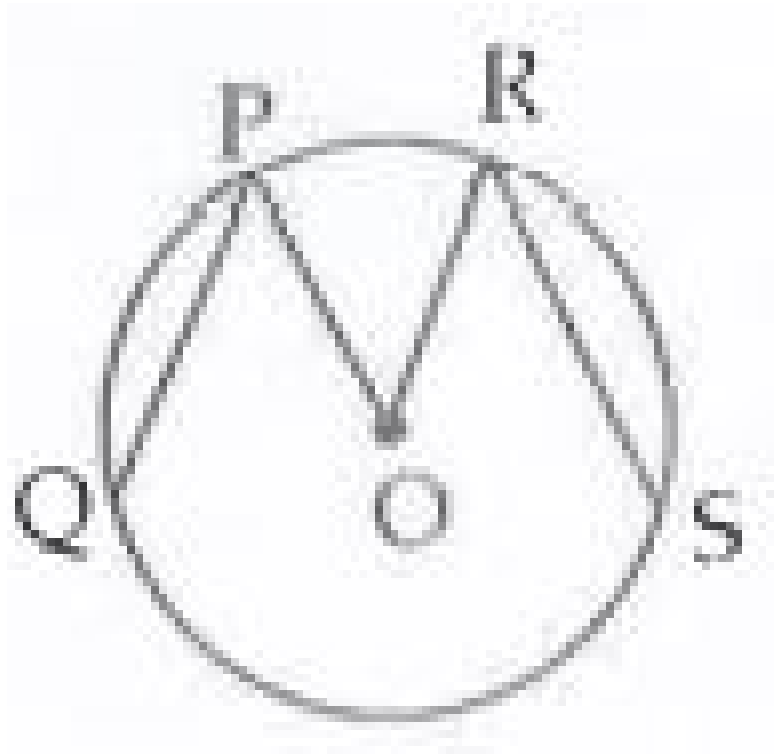
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46. In a circle with centre 'O', chord $PQ \cong$ chord RS . If $m\angle POR = 70^\circ$ and $m(\text{arc } RS) = 80^\circ$, then find $m(\text{arc } PR)$



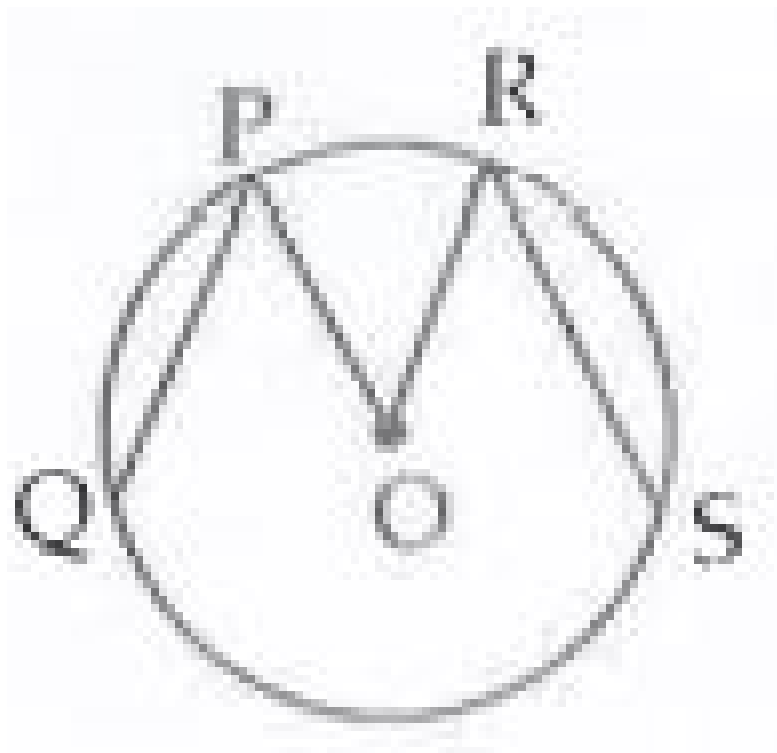
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47. In a circle with centre 'O', chord $PQ \cong$ chord RS . If $m\angle POR = 70^\circ$ and $m(\text{arc } RS) = 80^\circ$, then find $m(\text{arc } QSR)$



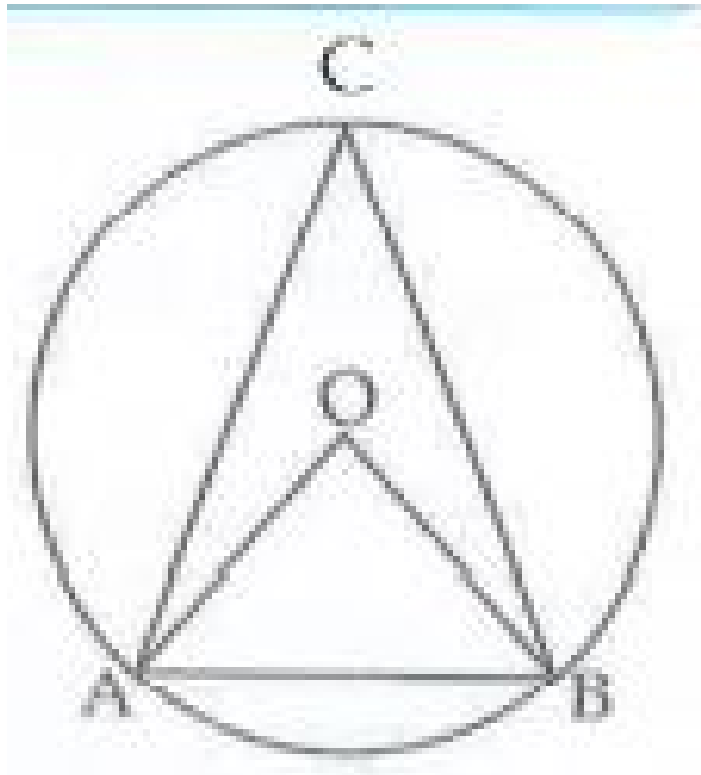
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48. In a circle with centre 'O', chord $PQ \cong$ chord RS . If $m\angle POR = 70^\circ$ and $m(\text{arc } RS) = 80^\circ$, then find $m(\text{arc } QS)$



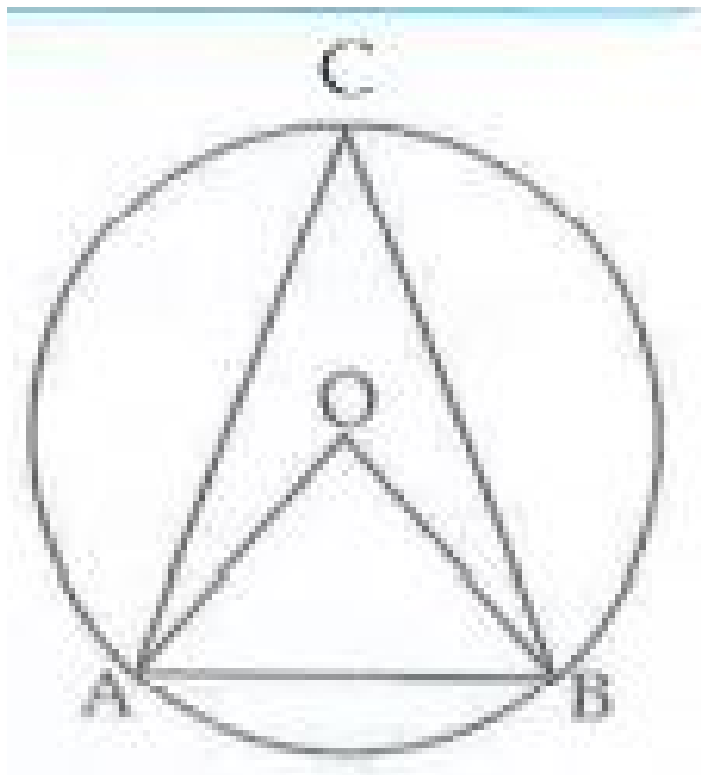
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49. In the adjoining figure, Point O is the centre of the circle. Length of chord AB is equal to the radius of the circle. Find (i) $\angle AOB$



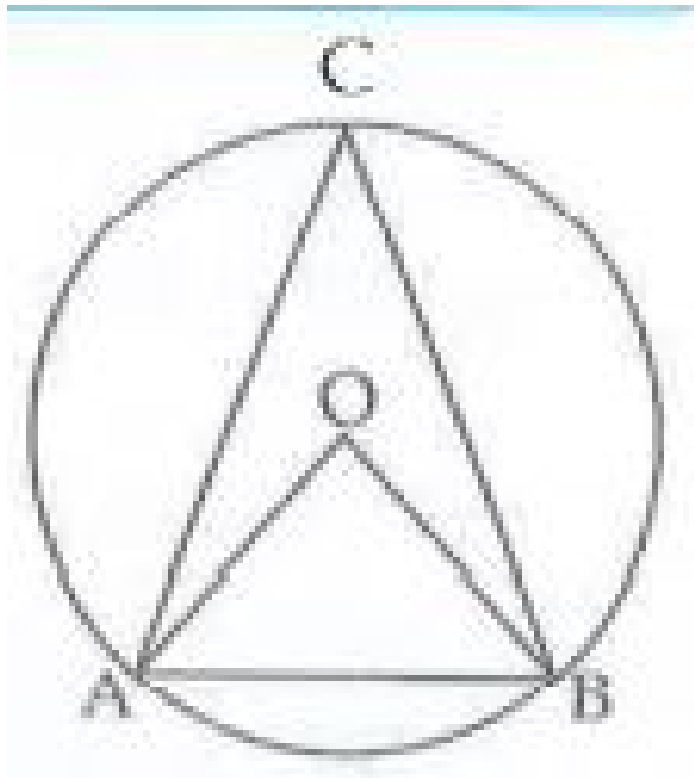
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50. In the adjoining figure, Point O is the centre of the circle. Length of chord AB is equal to the radius of the circle. Find $\angle ACB$



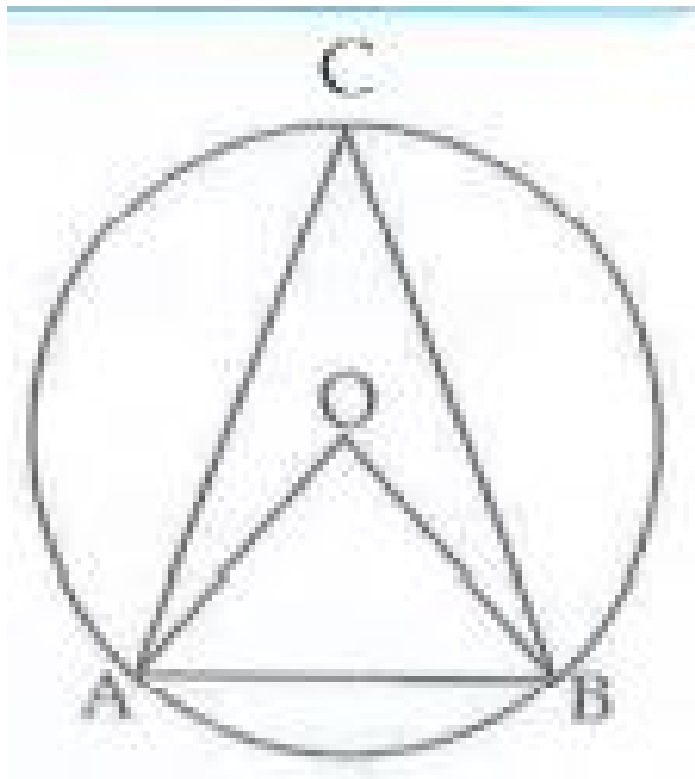
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51. In the adjoining figure, Point O is the centre of the circle. Length of chord AB is equal to the radius of the circle. Find $m(\text{arc AB})$



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52. 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 $m(\text{arc ACB})$

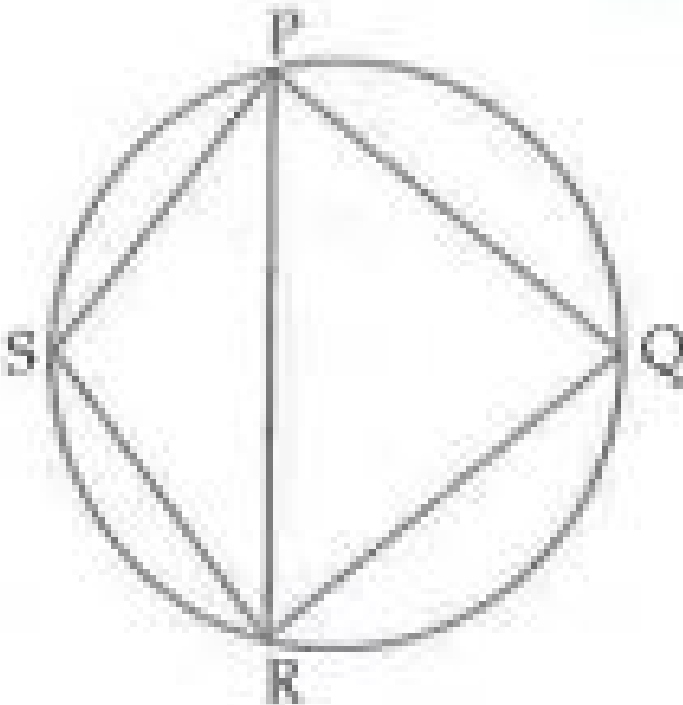


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53. In the adjoining figure, $\square PQRS$ is a cyclic quadrilateral.

$side PQ \cong side RQ$. $\angle PSR = 110^\circ$. Find (i)

$\angle PQR$



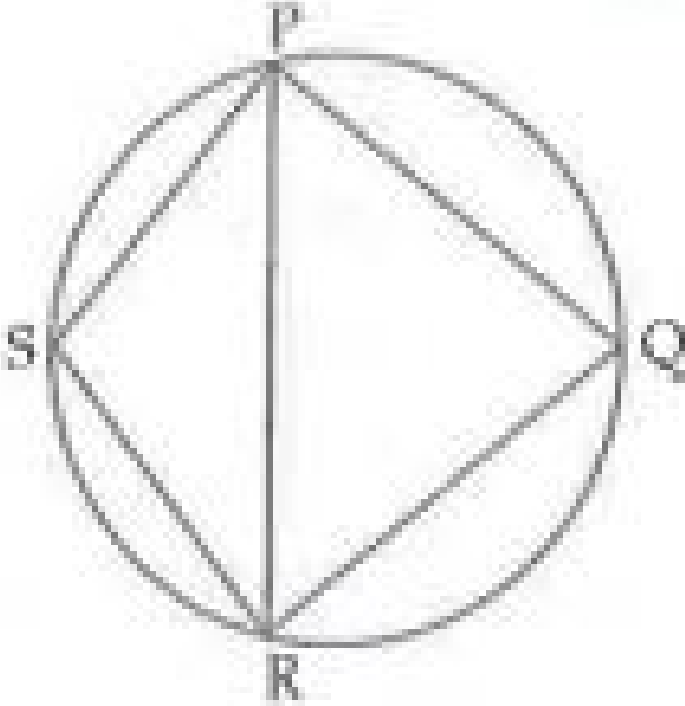


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54. In the adjoining figure, $\square PQRS$ is a cyclic quadrilateral.

$sidePQ \cong sideRQ$. $\anglePSR = 110^\circ$. Find

$m(\text{arc } PQR)$

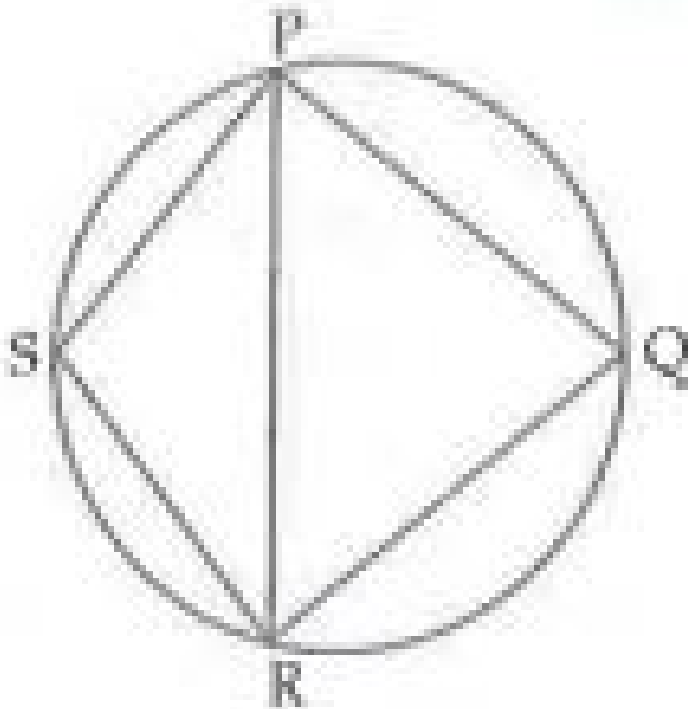


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55. In the adjoining figure, $\square PQRS$ is a cyclic quadrilateral.

$side PQ \cong side RQ$. $\angle PSR = 110^\circ$. Find (i)

$\angle PQR$

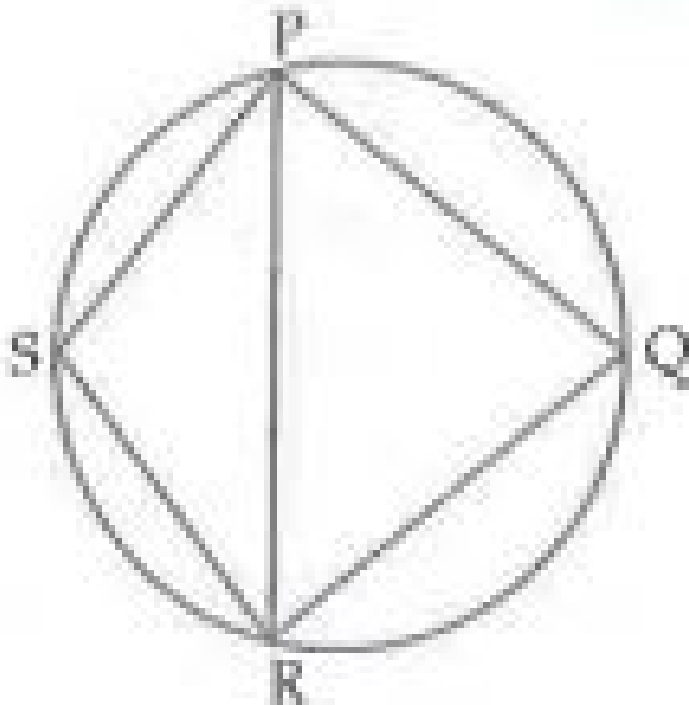


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56. In the adjoining figure, $\square PQRS$ is a cyclic quadrilateral.

$side PQ \cong side RQ$. $\angle PSR = 110^\circ$. Find

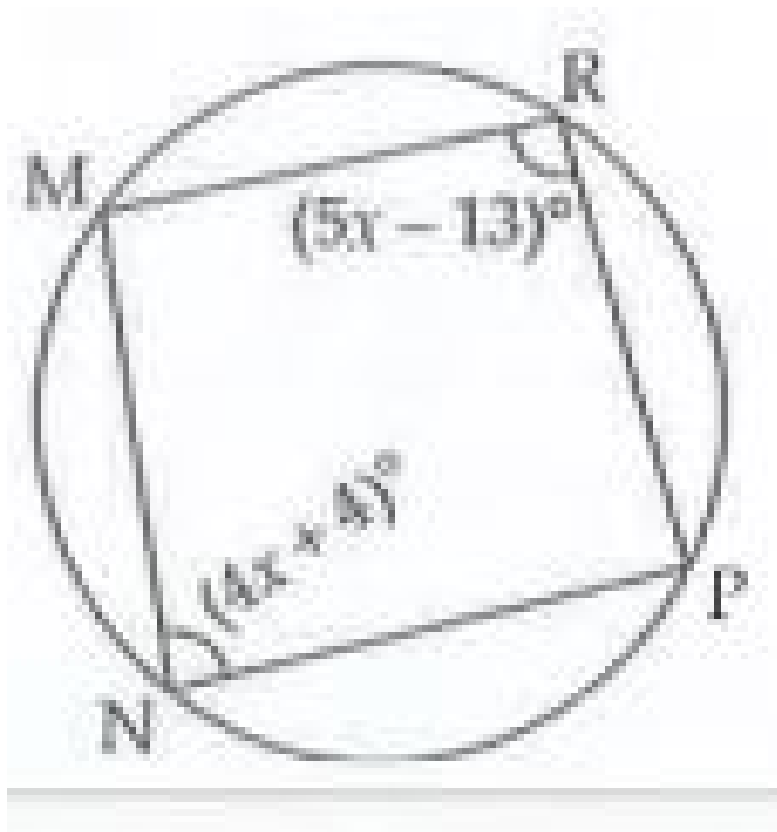
$\angle PRQ$





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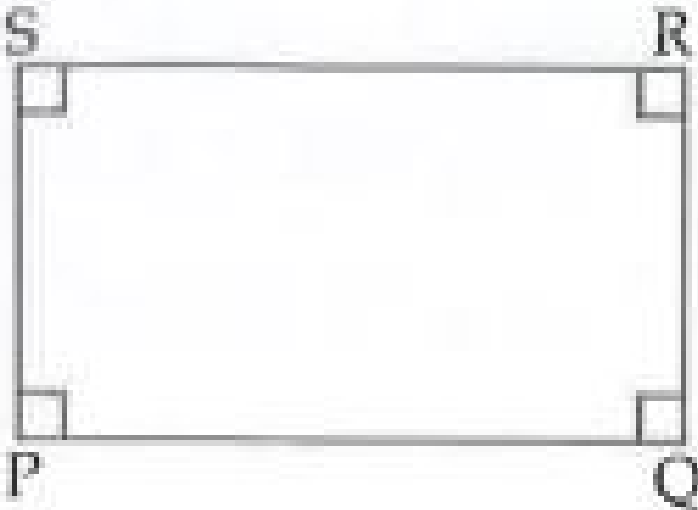
57. In cyclic $\square MRPN$, $\angle R = (5x - 13)^\circ$ and $\angle N = (4x + 4)^\circ$. Find the measures of $\angle R$ and $\angle N$





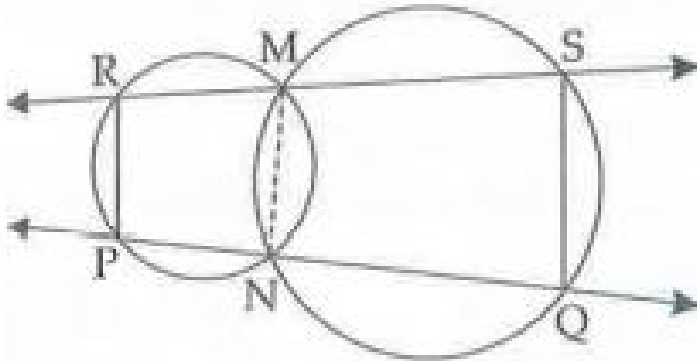
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58. Prove that any rectangle is a cyclic quadrilateral.



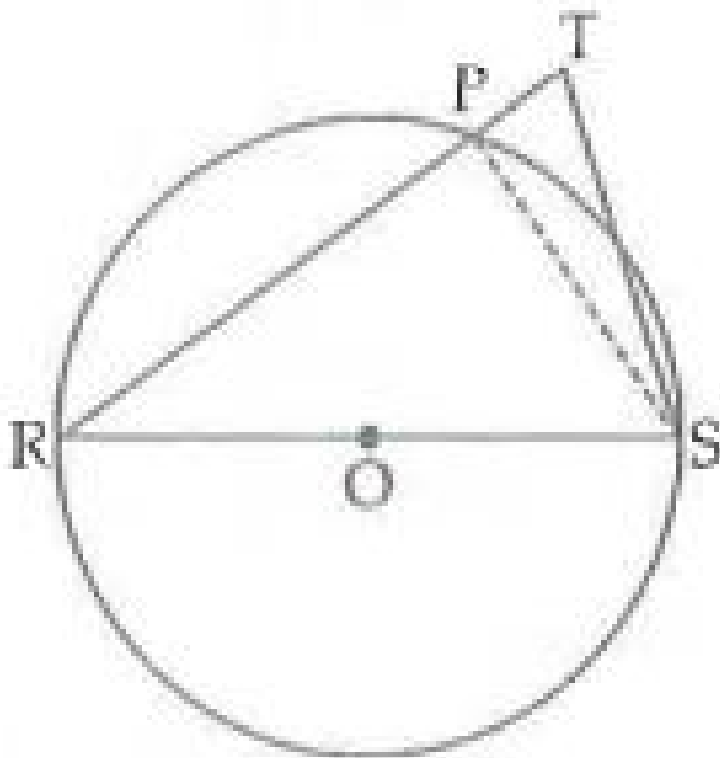
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59. In the adjoining figure, two circles intersect each other at point M and N. Secants drawn from point M and N intersect circles at point R, S, P and Q as shown in the figure. Prove that $\text{seg PR} \parallel \text{seg QS}$



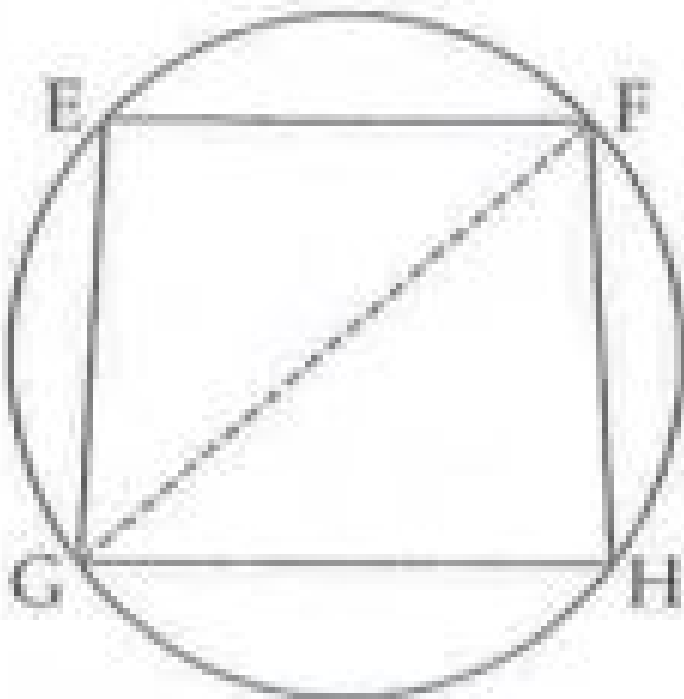
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60. In the adjoining figure, seg RS is the diameter of the circle with centre 'O'. Point T is in the exterior of the circle. Prove that $\angle RTS$ is an acute angle.



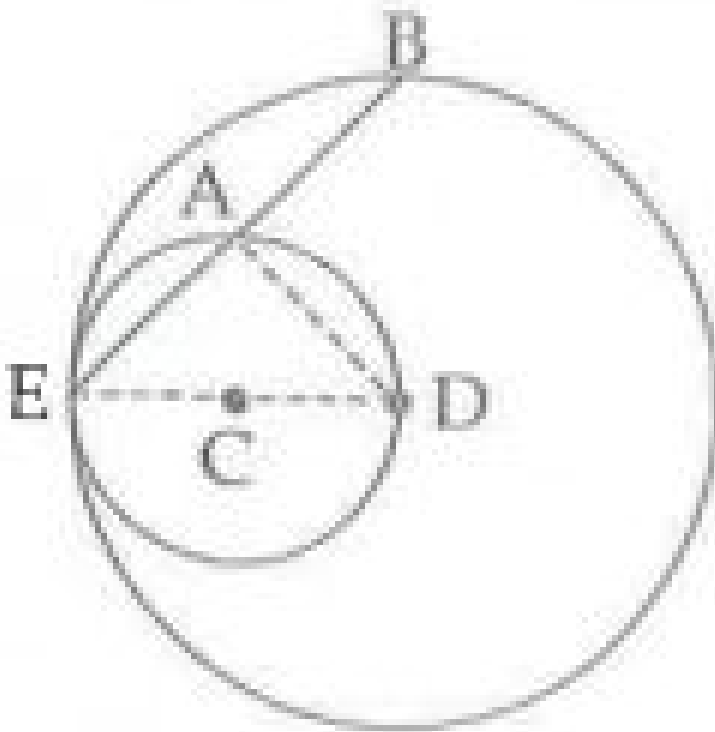
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61. In the adjoining diagram, chord $EF \parallel$ chord GH . Prove that chord $EG \cong$ chord FH



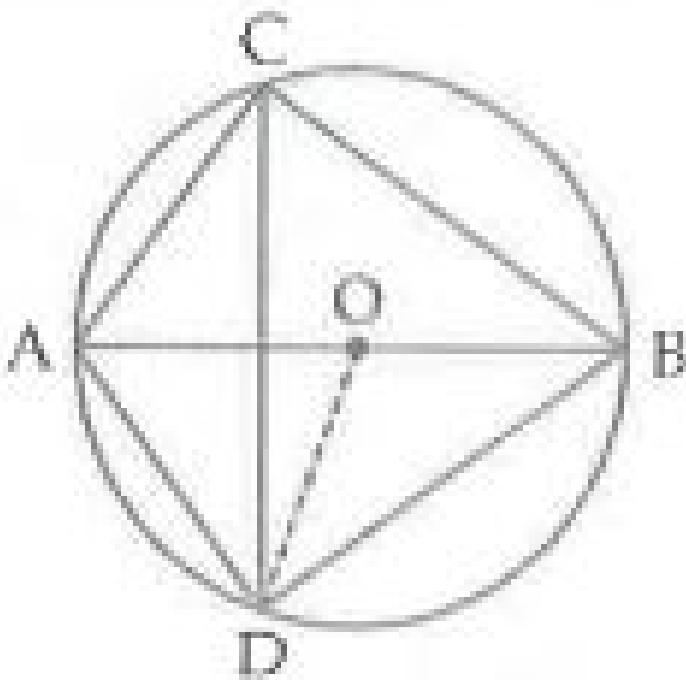
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62. A circle with centre C touches the circle with centre D internally in the point E . Point D lies on the smaller circle. Chord EB of the external circle intersects internal circle at point A . Prove that $segEA \cong segAB$





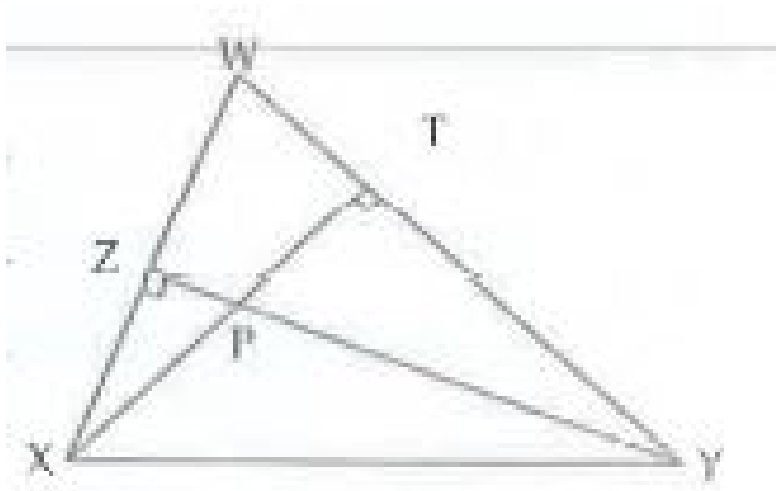
63. In the adjoining figure, seg AB is a diameter of a circle with centre O. Bisector of inscribed $\angle ACB$ intersects circle at point D. prove:
 $segAD \cong segBD$





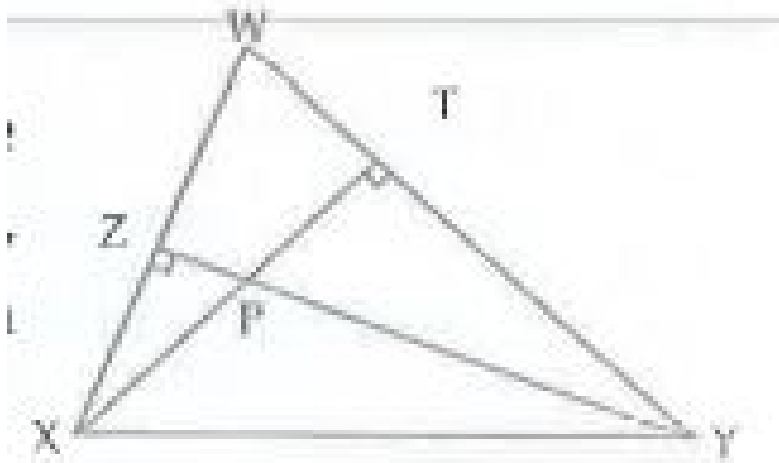
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64. In the adjoining figure, seg YZ and seg XT are altitudes of $\triangle WXY$ which intersect each other at point P . Prove that $\square WZPT$ is a cyclic quadrilateral.



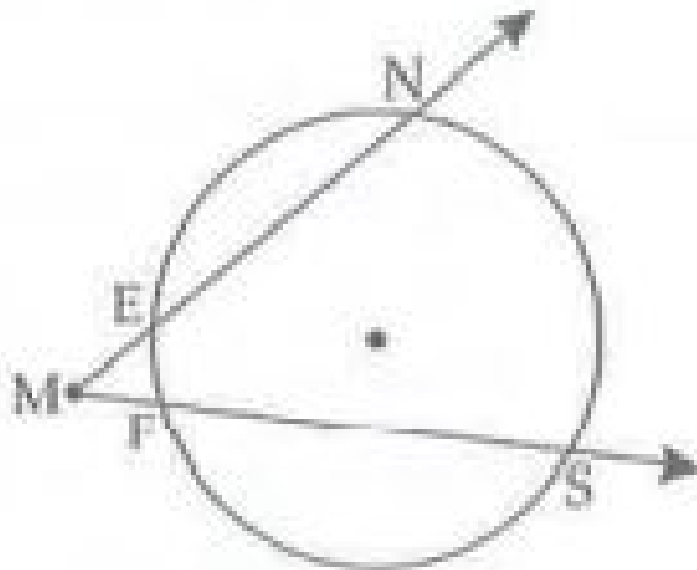
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65. In the adjoining figure, seg YZ and seg XT are altitudes of $\triangle WXY$ which intersect each other at point P . Prove that: Points X, Z, T and Y are concyclic points.



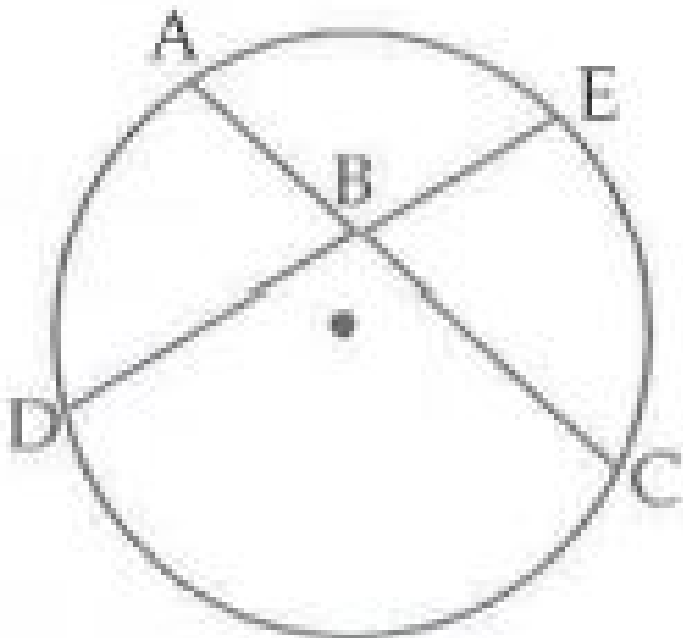
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66. In the adjoining figure, $m(\text{arc}NS) = 125^\circ$, $m(\text{arc}EF) = 37^\circ$. Find $m\angle NMS$.



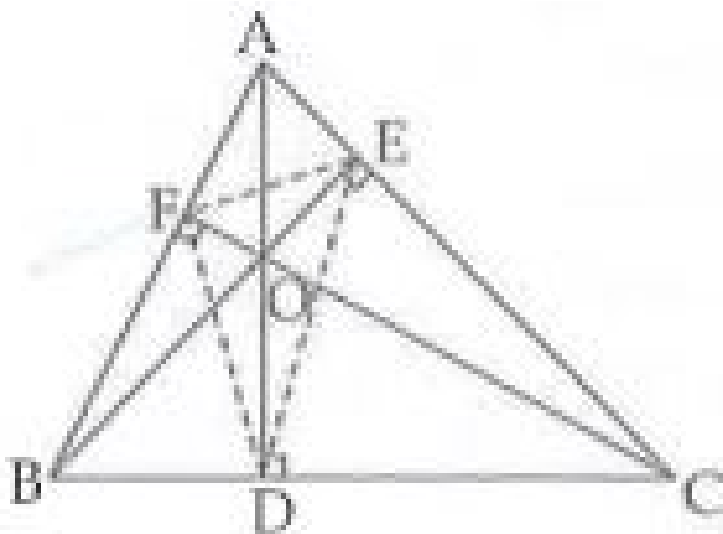
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67. In the adjoining figure, chord AC and chord DE intersect at point B. If $\angle ABE = 108^\circ$ and $m(\text{arc } AE) = 95^\circ$, then find $m(\text{arc } DC)$.



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68. In the adjoining figure, $segAD \perp sideBC$, $segBE \perp sideAC$, $segCF \perp sideAB$. Point O is the orthocentre. Prove that, Point O is the incentre of $\triangle DEF$.



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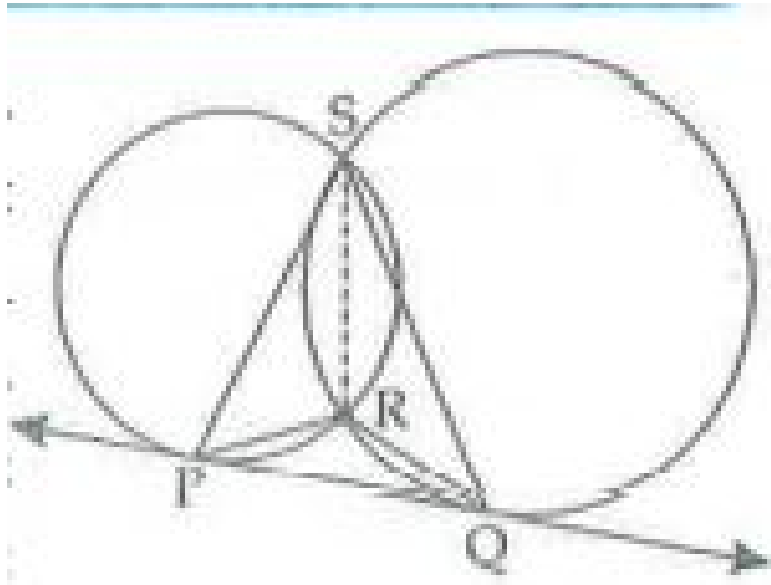
69. Prove that any three points on a circle cannot be collinear.



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70. In the adjoining figure, two circles intersect each other in point R and point S. Line PQ is a common tangent touching circle at points P

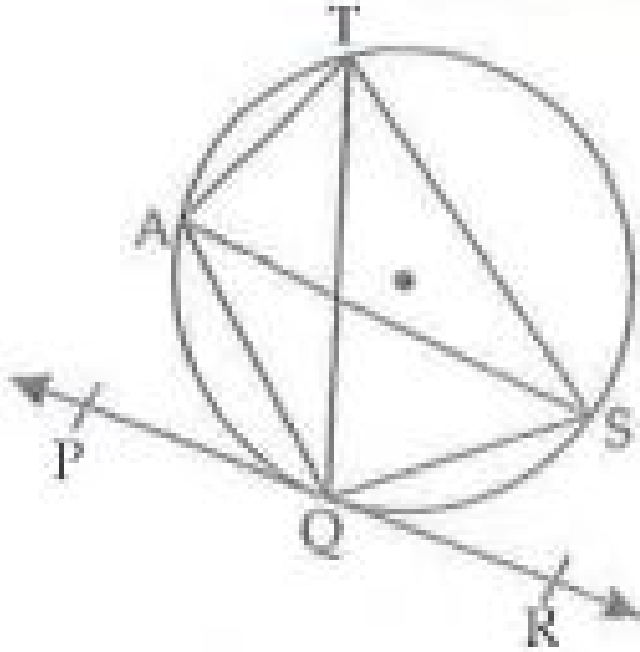
and Q. Prove that $\angle PRQ + \angle PSQ = 180^\circ$



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

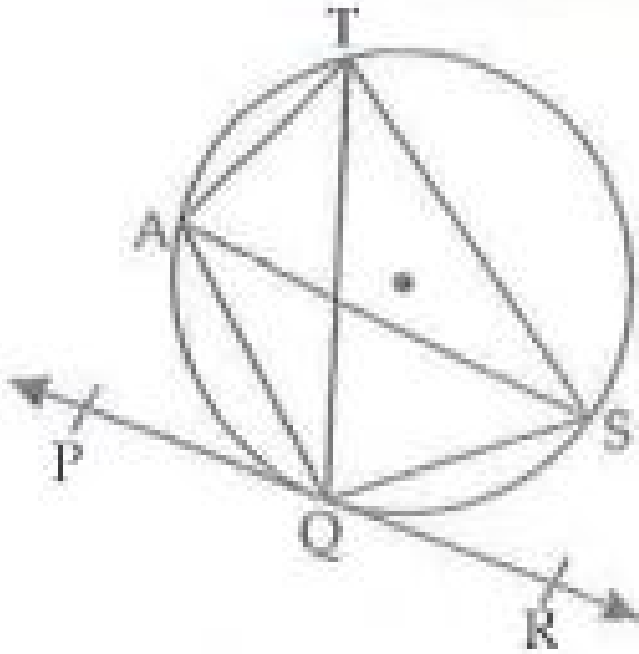
What is the sum of $\angle TAQ$ and $\angle TSQ$?



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72. In the adjoining figure, line PR touches the circle at point Q. Using the information given

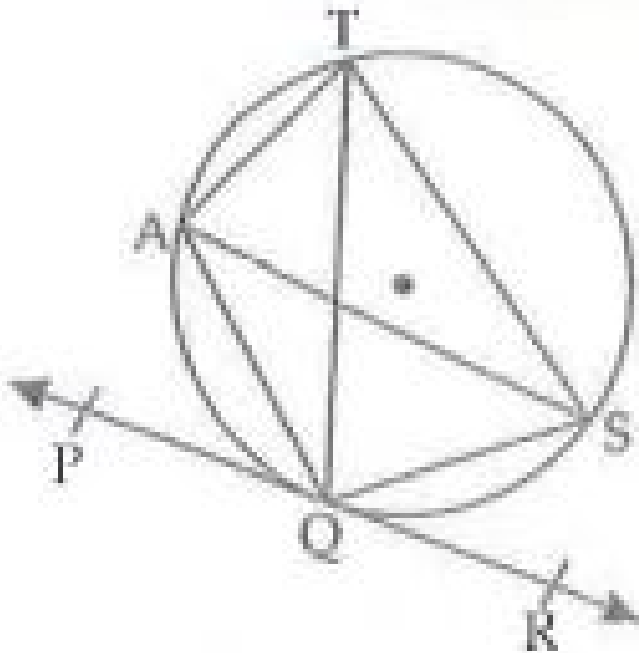
in the diagram, answer the following questions: Write names of angles congruent to $\angle AQP$



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

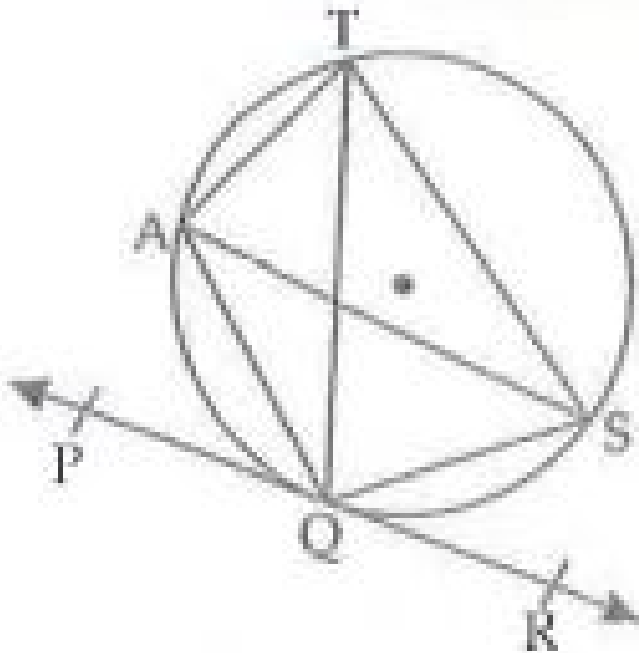
Write names of angles congruent to $\angle QTS$



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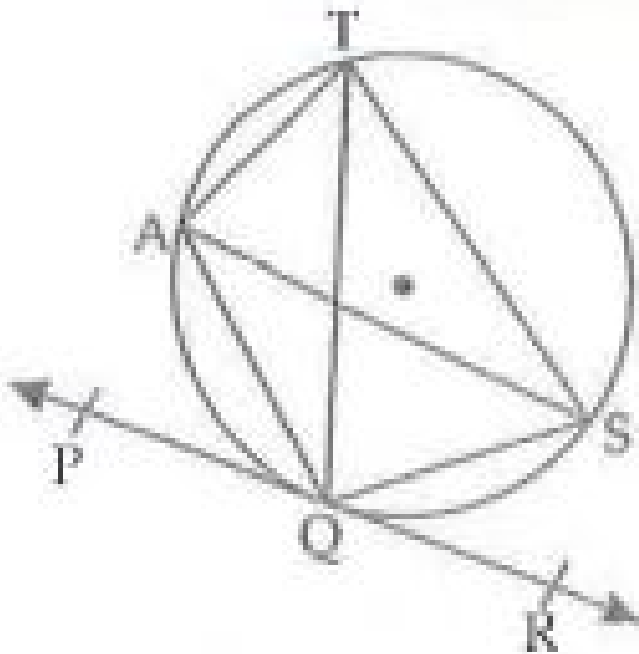
74. In the adjoining figure, line PR touches the circle at point Q. Using the information given in the diagram, answer the following question:

If $\angle TAS = 65^\circ$, then find $\angle TQS$ and arc TS.



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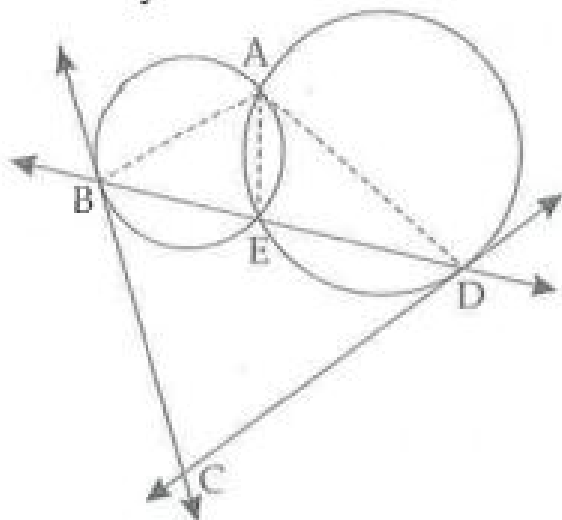
75. In the adjoining figure, line PR touches the circle at point Q. Using the information given in the diagram, answer the following question:
 If $\angle AQP = 42^\circ$ and $\angle SQR = 58^\circ$, then find $\angle ATS$



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76. 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 points B and D intersect each other at point C.

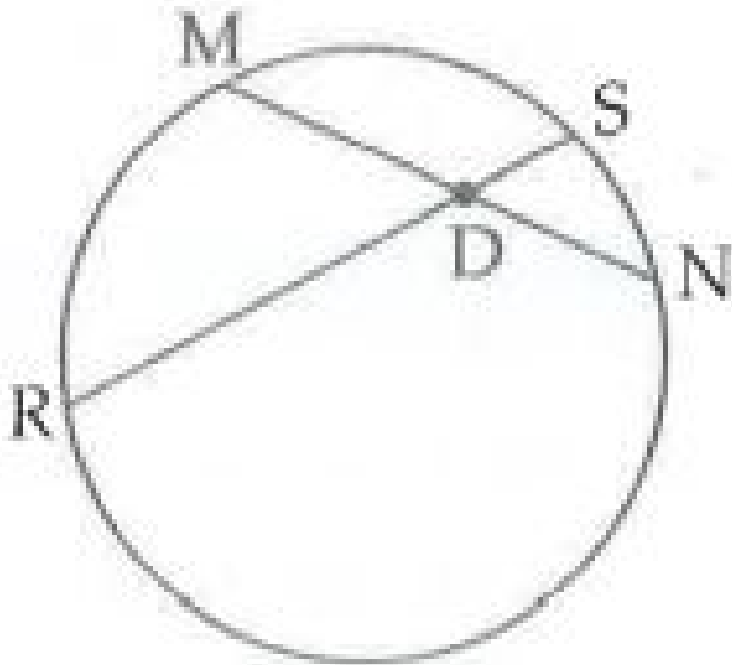
Prove that $\square ABCD$ is cyclic.





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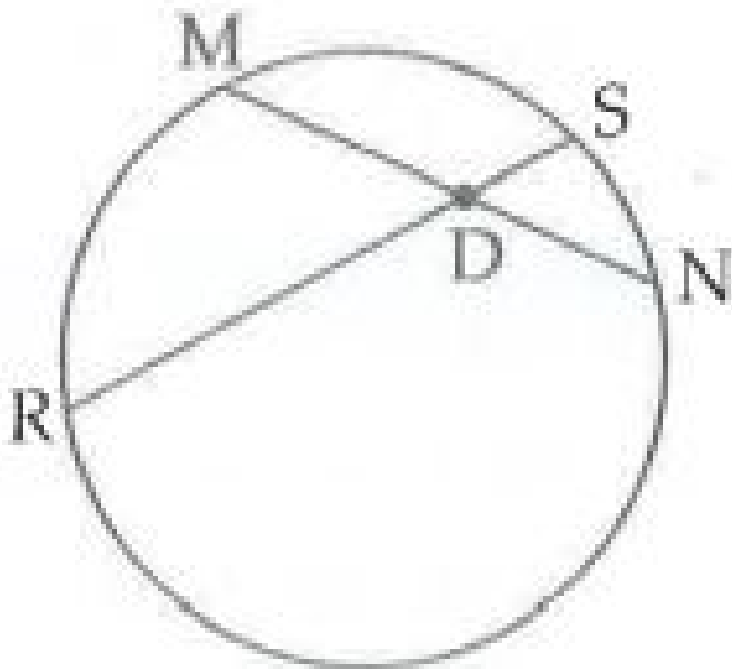
77. In the adjoining figure, chord MN and RS intersect each other at point D . If $RD=15$, $DS=4$, $MD=8$, then $DN=?$





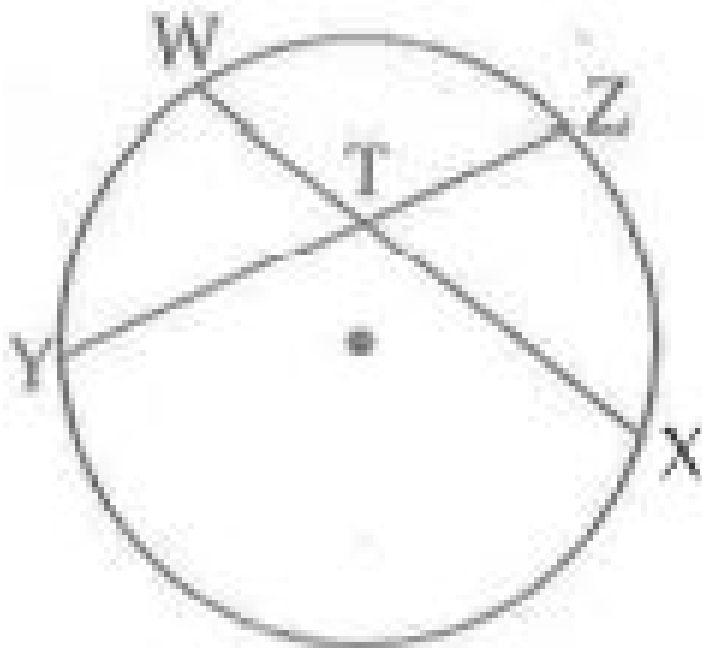
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78. In the adjoining figure, chord MN and RS intersect each other at point D . If $RS=18$, $MD=9$, $DN=8$, then $DS=?$



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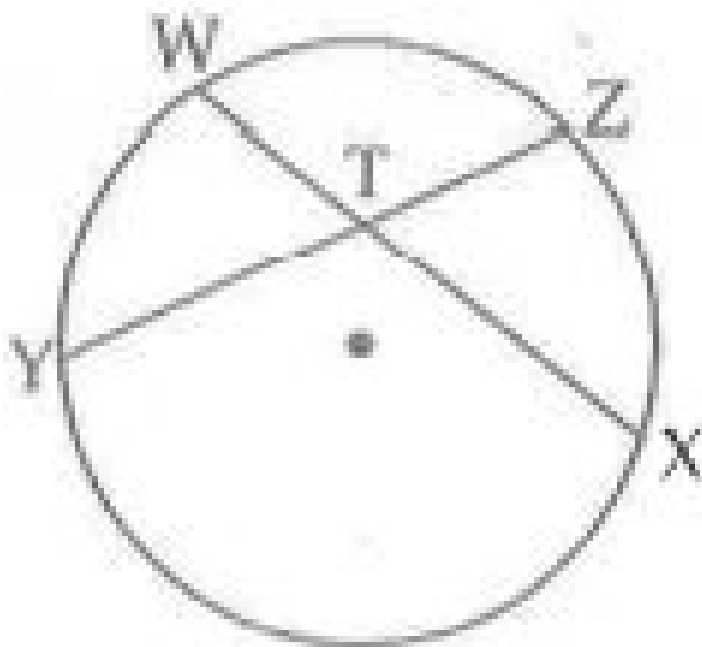
79. In the adjoining figure, $m(\text{arc}WY) = 44^\circ$,
 $m(\text{arc}ZX) = 68^\circ$, then find $m\angle ZTX$



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80. In the adjoining figure, $m(\text{arc}WY) = 44^\circ$,
 $m(\text{arc}ZX) = 68^\circ$. If

$l(WT) = 4.8$, $l(TX) = 8$, $l(YT) = 6.4$, then
find $l(TZ)$.



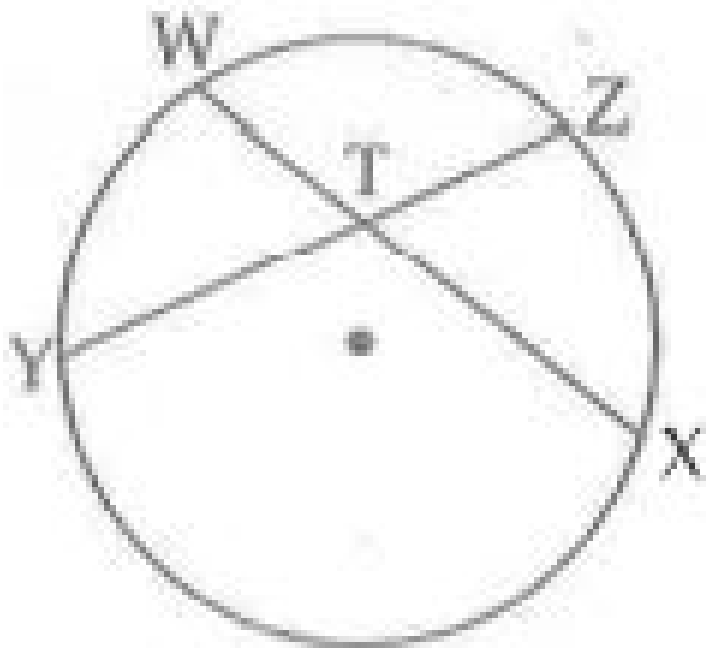
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81. In the adjoining figure, $m(\text{arc}WY) = 44^\circ$,

$m(\text{arc}ZX) = 68^\circ$. If

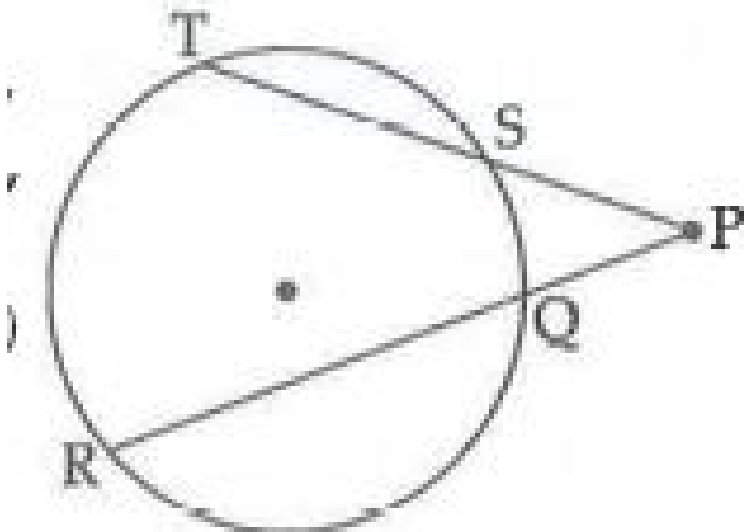
$l(WX) = 25$, $l(YT) = 8$, $l(YZ) = 26$, then

find $l(WT)$.



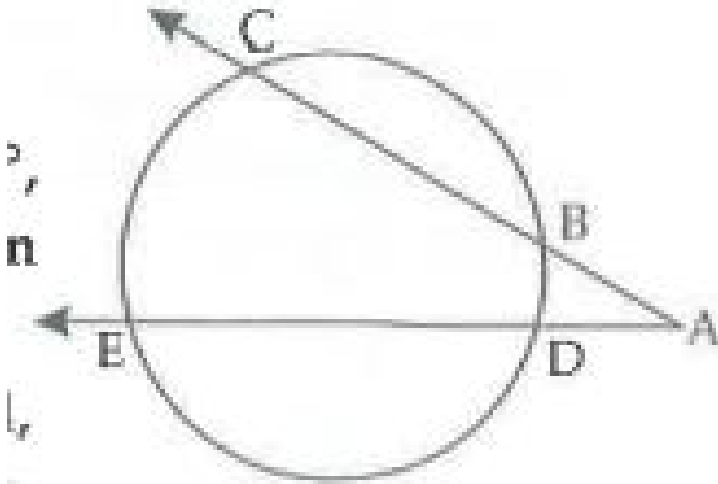
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82. In the adjoining figure, if $PQ=6$, $QR=10$, $PS=8$, then find TS .



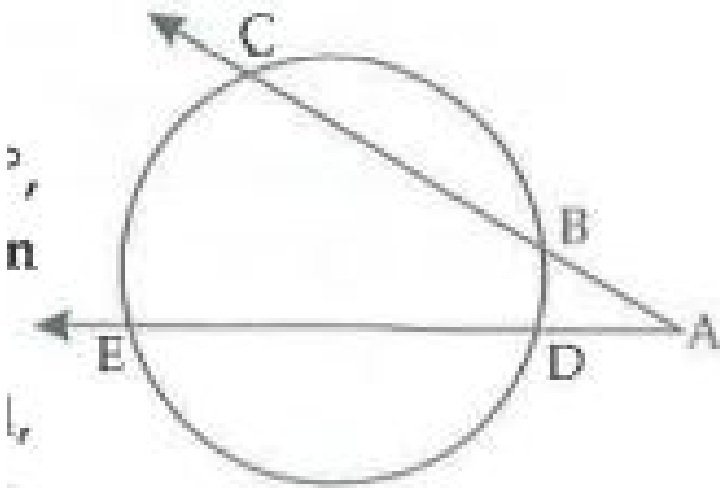
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83. In the adjoining figure, If $m(\text{arc } CE) = 54^\circ$, $m(\text{arc } BD) = 23^\circ$, then find $\angle CAE$



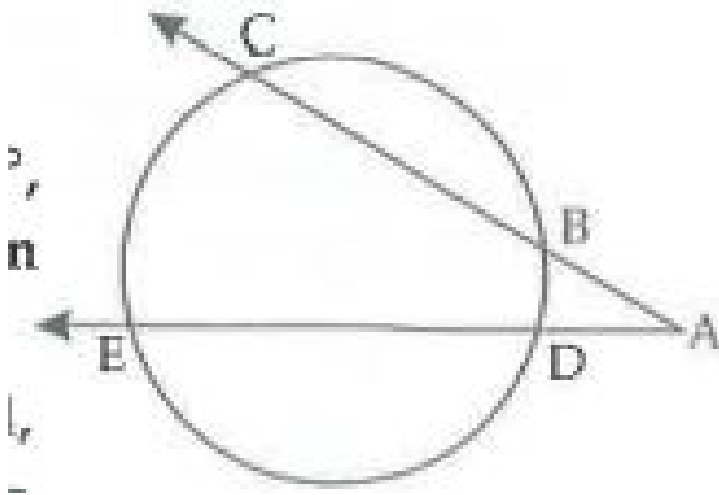
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84. In the adjoining figure, If $AB=4.2$, $BC=5.4$, $AE=12$, then find AD .



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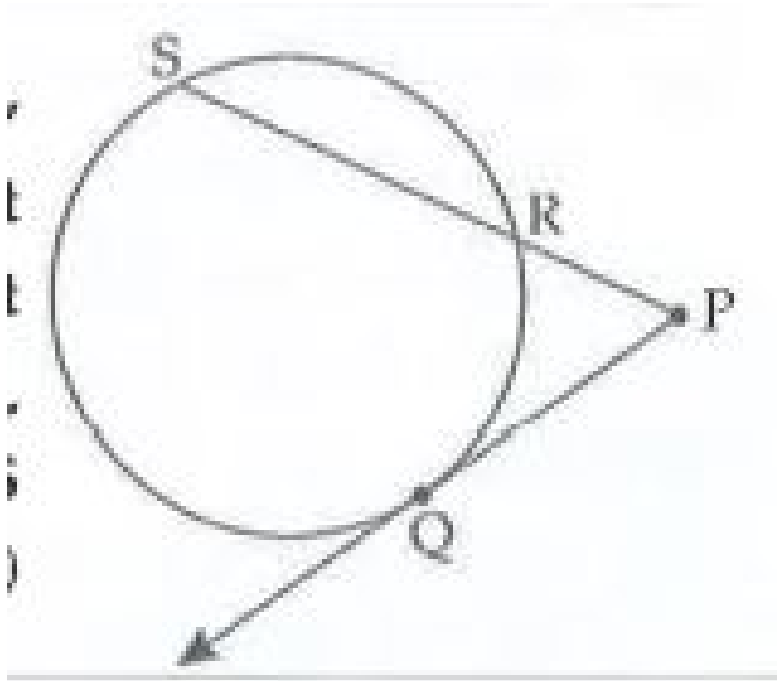
85. In the adjoining figure, If $AB=3.6$, $AC=9.0$, $AD=5.4$, then find AE .



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86. In the adjoining figure, point Q is the point of contact of tangent and the circle. If $PQ=12$,

PR=8, then find PS and RS.

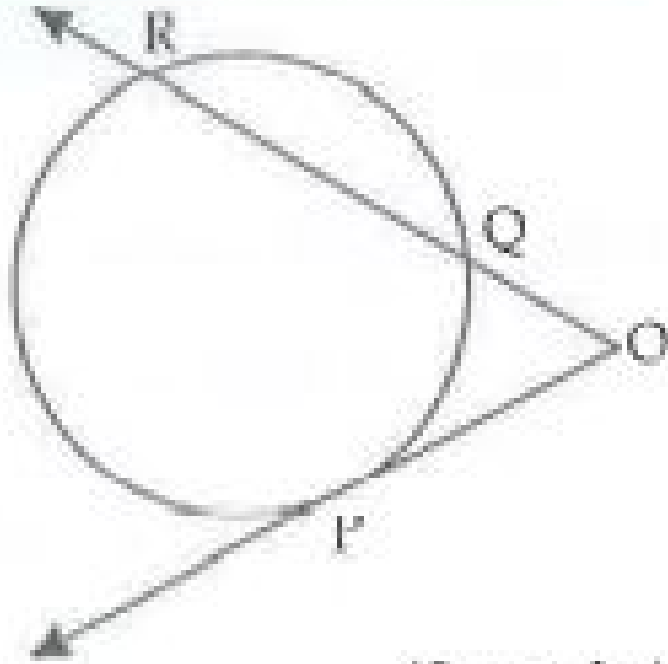


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87. In the adjoining diagram,

$m(\text{arc } PR) = 140^\circ$, $m\angle POR = 36^\circ$. Find

$m(\text{arc } PQ)$.

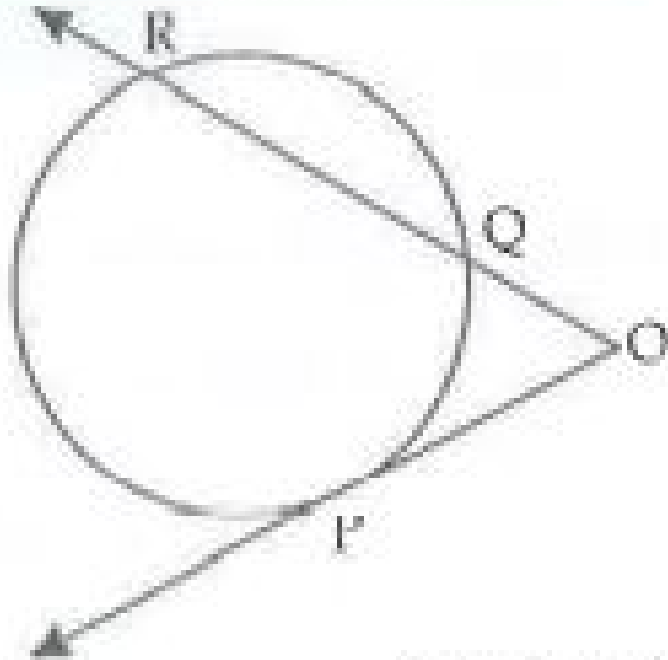


(3 marks)



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88. In the adjoining diagram, If $OP=7.2$, $OQ=3.2$, then find QR and OR .

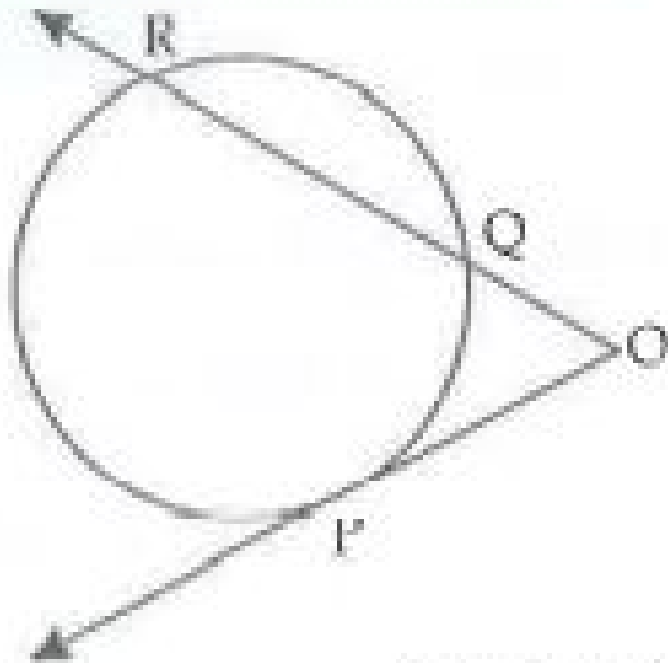


(3 marks)



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89. In the adjoining diagram, If $OP=7.2$, $OR=16.2$, then find QR .

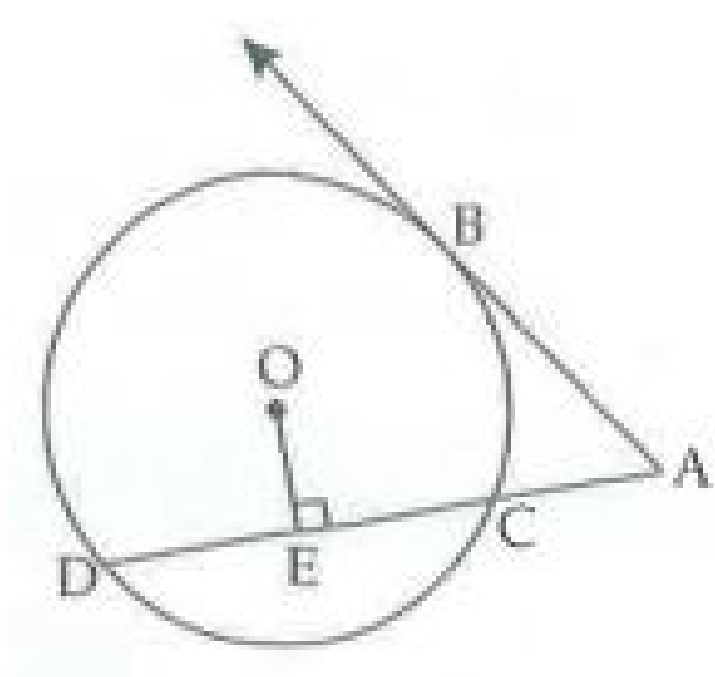


(3 marks)



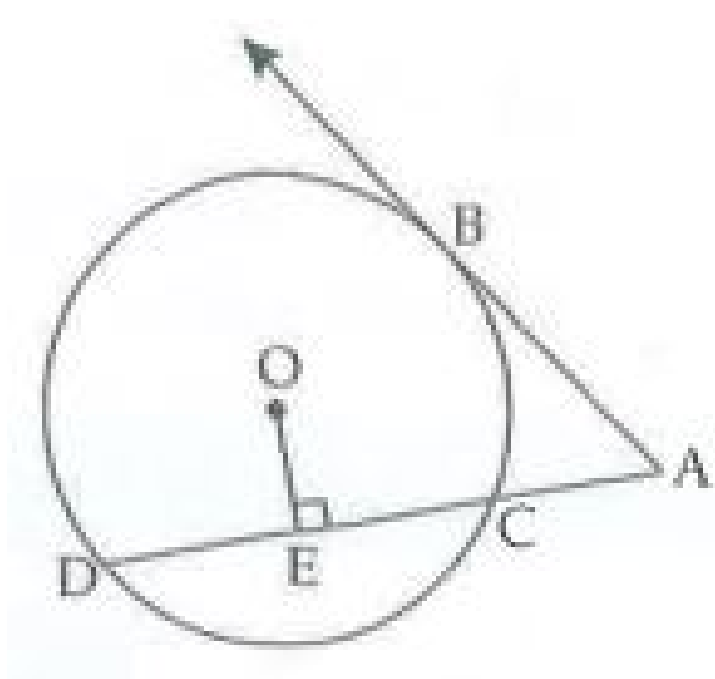
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90. In the adjoining figure, point B is the point of contact and point O is the centre of the circle. $segOE \perp segAD$, if $AB=12$, $AC=8$, then find AD



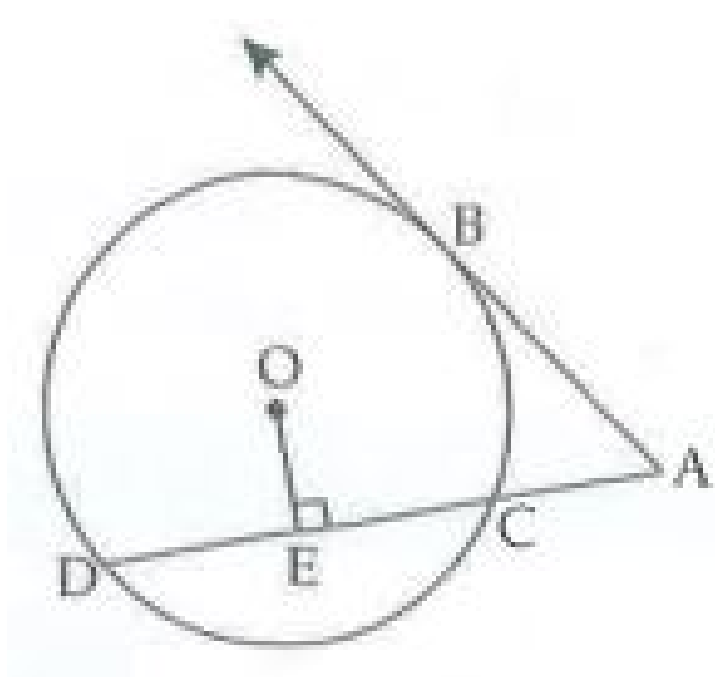
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91. In the adjoining figure, point B is the point of contact and point O is the centre of the circle. $segOE \perp segAD$, if $AB=12$, $AC=8$, then find DC.



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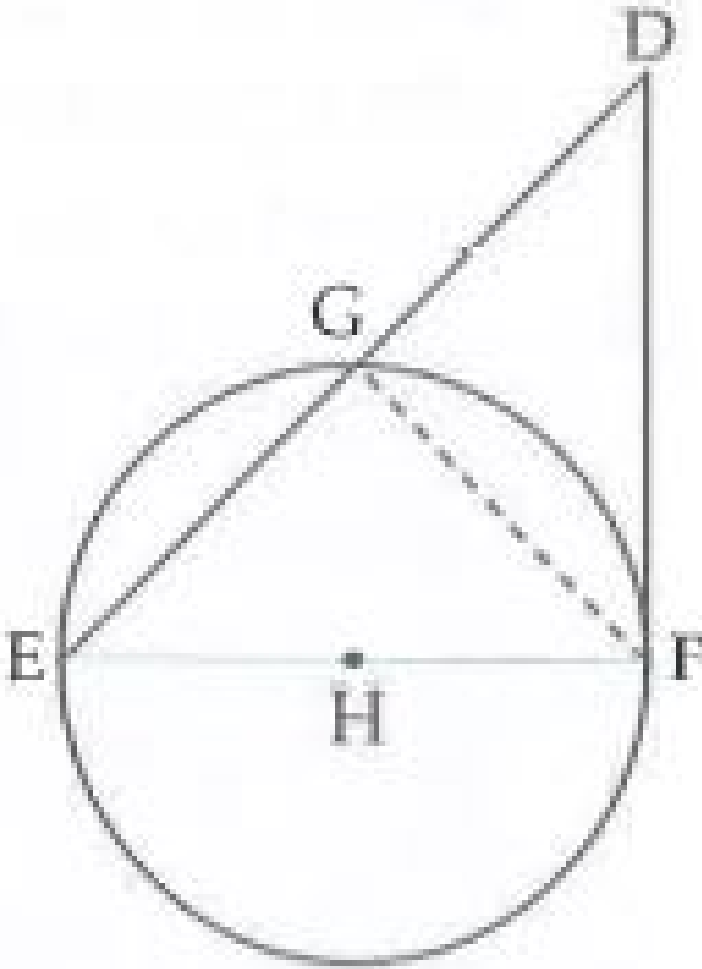
92. In the adjoining figure, point B is the point of contact and point O is the centre of the circle. $segOE \perp segAD$, if $AB=12, AC=8$, then find (iii) DE.



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



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Exercise

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



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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:



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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:



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4. length of a tangent segment drawn from a point which is at a distance 12.5 cm from the

center of a circle is 12 cm, find the diameter of the circle.

A. 25 cm

B. 24 cm

C. 7 cm

D. 14 cm

Answer:



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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 arc 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:



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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

A. 7

B. 8

C. 11.2

D. 9

Answer:



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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) 36° b) 72° c) 90° d) 108°

A. 36

B. 72

C. 90

D. 108

Answer:



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

A. Equilateral triangle

B. Scalene triangle

C. Right angled triangle

D. Isosceles triangle

Answer:



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

- (1) It is 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 definite statement for measure of $\angle XYZ$

A. only one

B. only two

C. only three

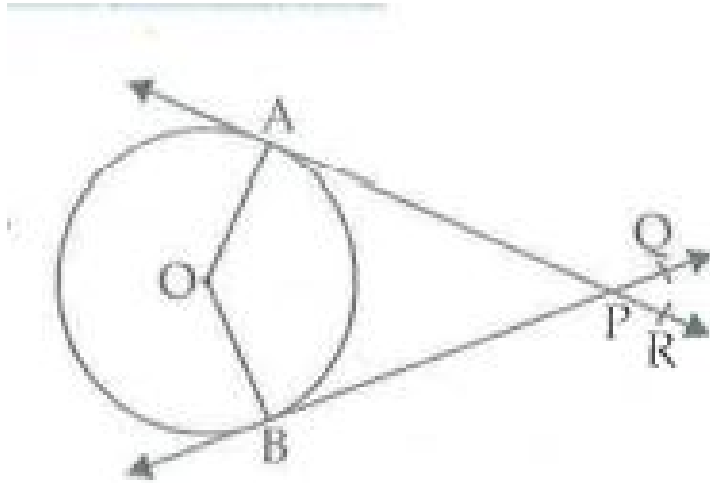
D. all

Answer:



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11. $\angle QPR = 60^\circ$, then $\angle AOB = \dots$ a) 60° b) 90° c) 120° d) 240°



A. 60°

B. 90°

C. 120°

D. 240°

Answer:



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12. 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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13. Point P is on the circle. AB is diameter of the circle, $\angle APB$ isa) a Reflex angle b) an acute angle c) a Right angle d) an obtuse angle

A. a Reflex angle

B. an acute angle

C. a Right angle

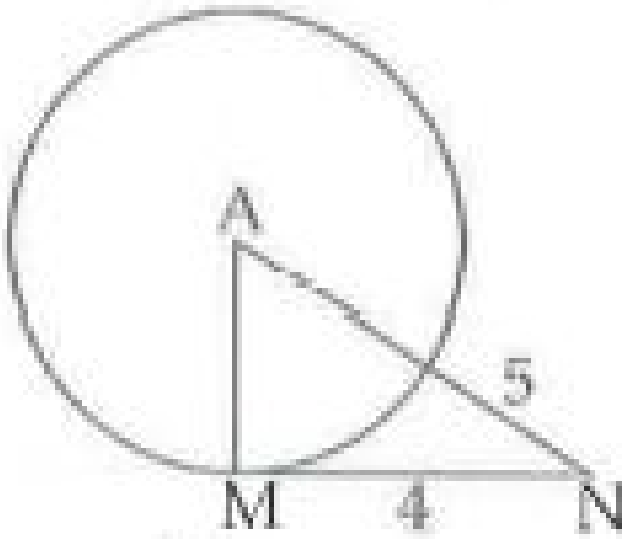
D. an obtuse angle

Answer:



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14. MN is tangent at M and AM is radius. Find AM.



A. 6

B. 3

C. $3\sqrt{3}$

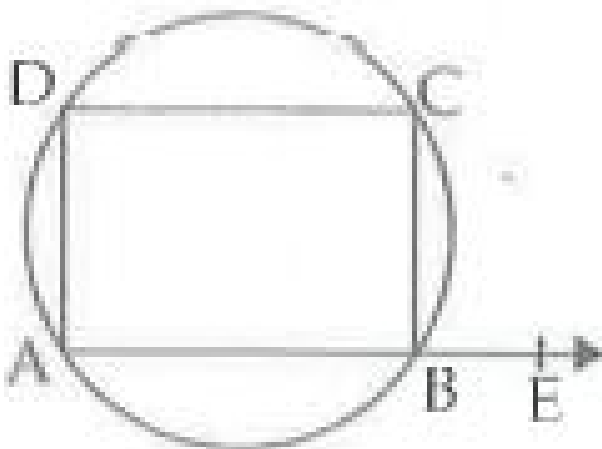
D. 1

Answer:





15. $\angle ADC = 80^\circ$, then $\angle CBE = ?$ a) 100° b) 10° c) 80° d) 280°



A. 100°

B. 10°

C. 80°

D. 280°

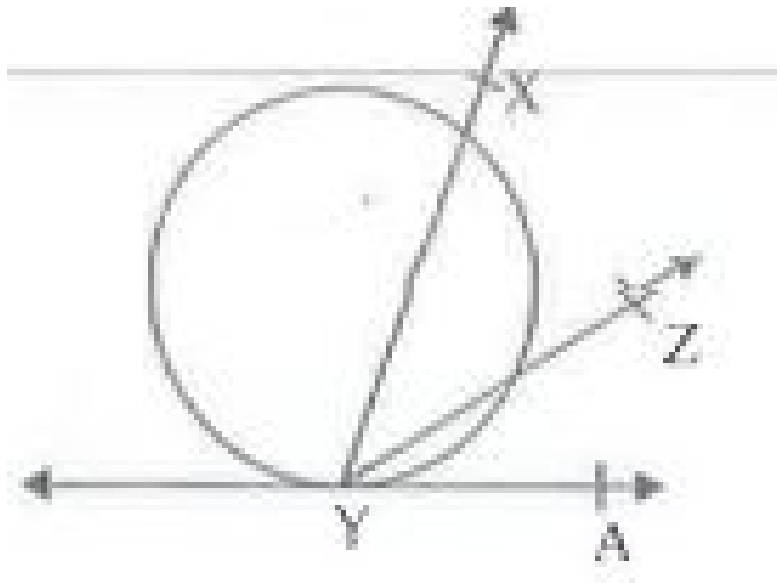
Answer:



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16. $\angle XYZ = 40^\circ$, $\angle AYZ = 20^\circ$, line AY is tangent at point Y. $\therefore m(\text{arc } XY) = \dots\dots\dots a$

80° b)40° c)60° d)120°



A. 80°

B. 40°

C. 60°

D. 120°

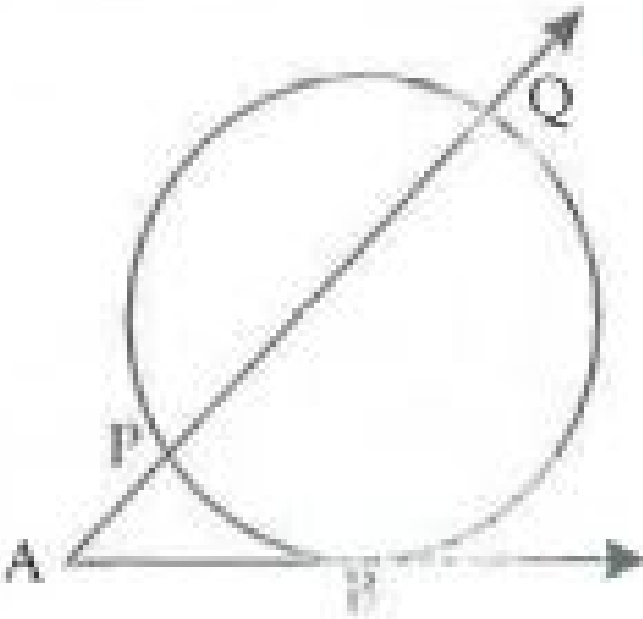
Answer:



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

$\therefore PQ = \dots\dots$ a) 12 b) 18 c) 6 d) 20



A. 18

B. 6

C. 12

D. 20

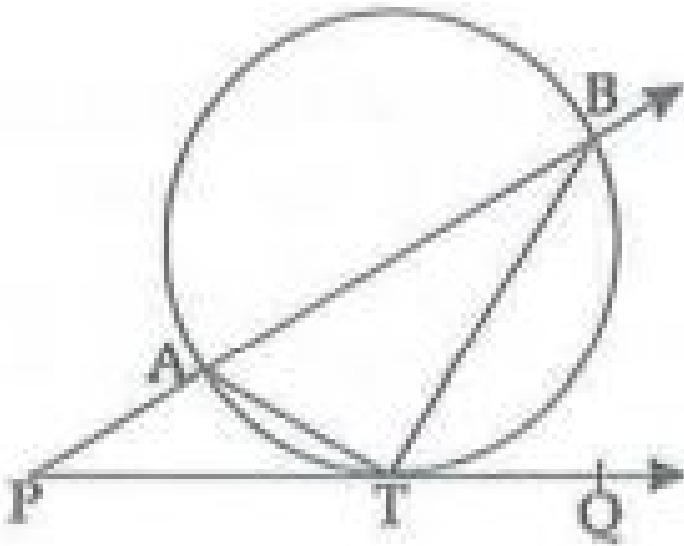
Answer:



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18. Line PT is a 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).



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

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

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

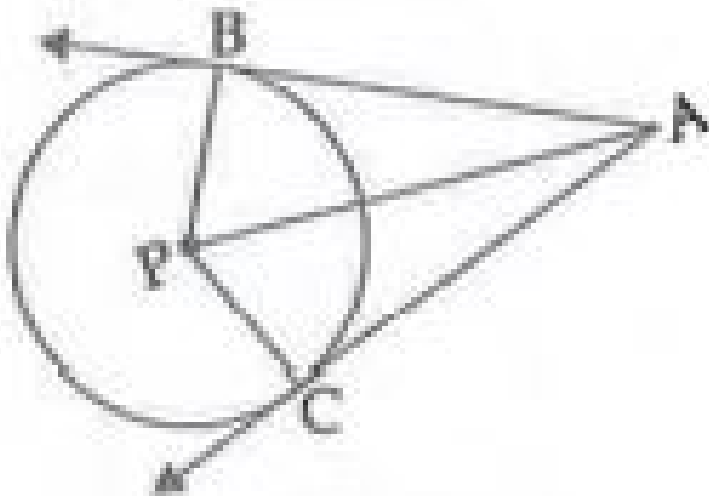
D. None of (A),(B),(C).

Answer:



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



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

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

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

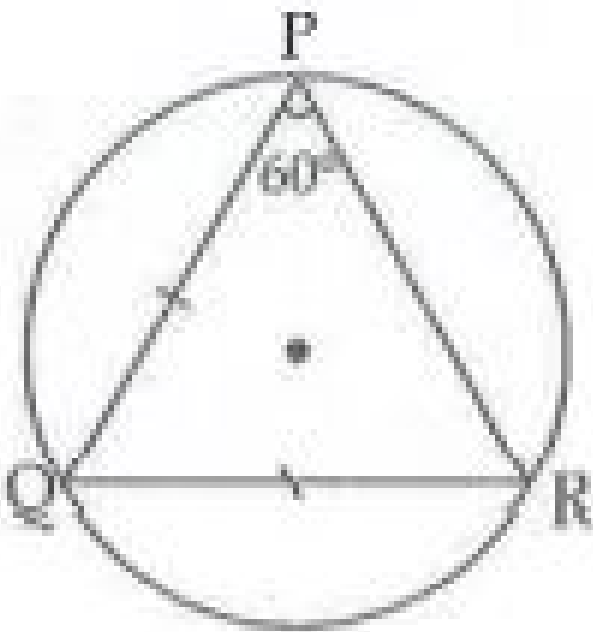
D. All of (A),(B),(C).

Answer:



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20. In adjoining figure, $PQ=QR$. $\angle P = 60^\circ$. $m(\text{arc PR}) = \dots\dots\dots$



A. 120°

B. 60°

C. 90°

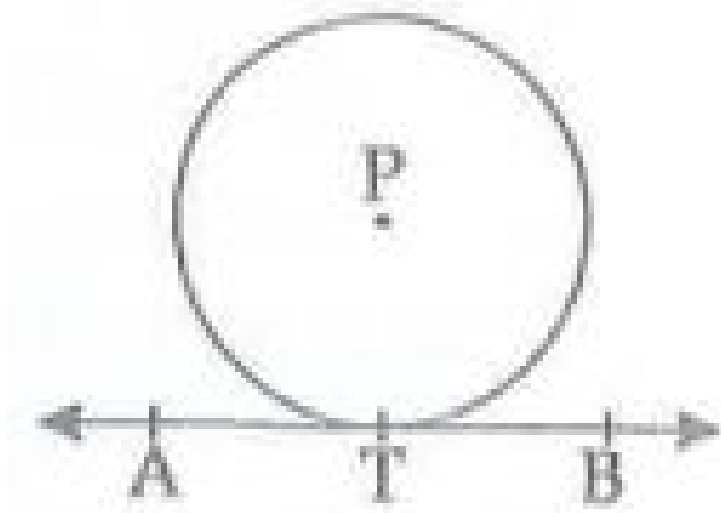
D. 240°

Answer:



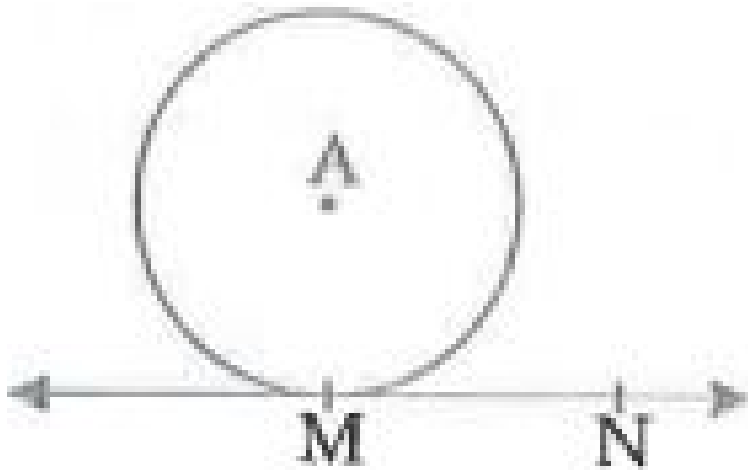
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21. In the adjoining figure, point P is the centre of the circle and line AB is the tangent of the circle at T. The radius of the circle is 6 cm. Find PB if $\angle TPB = 60^\circ$



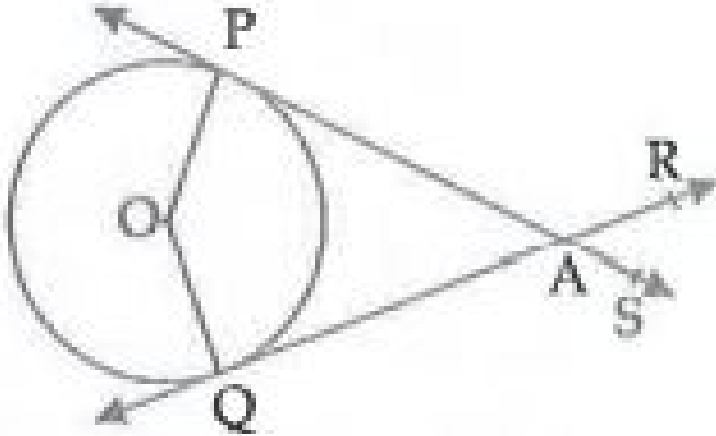
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22. In the adjoining figure, point A is the center of the circle. $AN=10$ cm. Line NM is tangent at M. $MN=5$ cm. Find the radius.



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23. A circle with centre O . point A is the exterior of the circle. Line AP and line AQ are tangents at point P and point Q respectively. P - A - S , Q - A - R , $\angle PAR = 130^\circ$. Find $\angle AOP$



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24. Two tangents TP and TQ are drawn to a circle with centre O from an external point T.

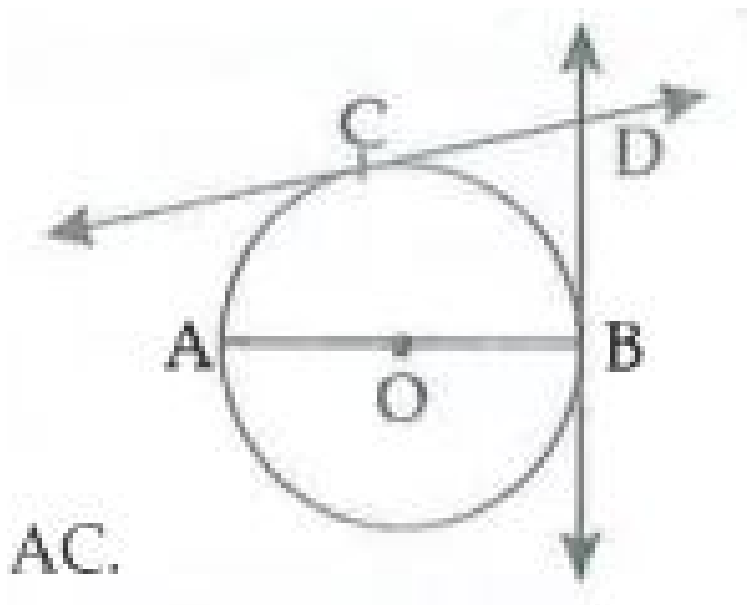
Prove that $\angle PTQ = 2\angle OPQ$



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25. 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 $segOD \perp segAC$



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26. Two circles of radii 5 cm and 3 cm touch externally. Find the distance between their centres.



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



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28. The circles which are not congruent touch externally. The sum of their areas is $130\pi cm^2$

and distance between their centres is 14 cm.

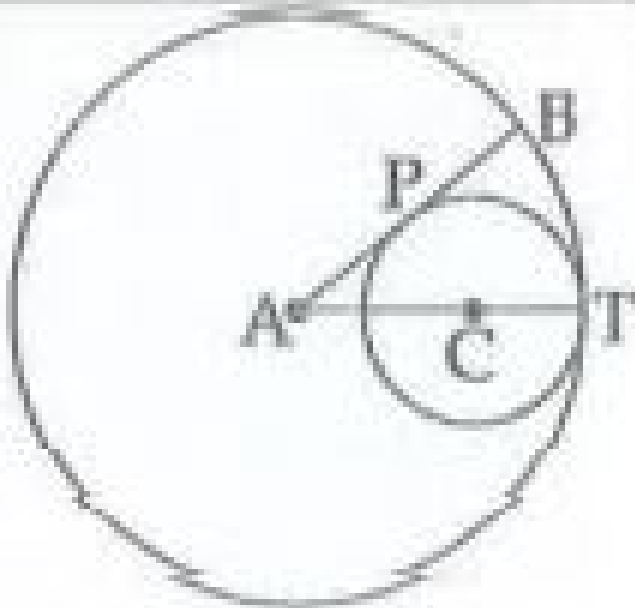
Find the radii of the two circles.



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

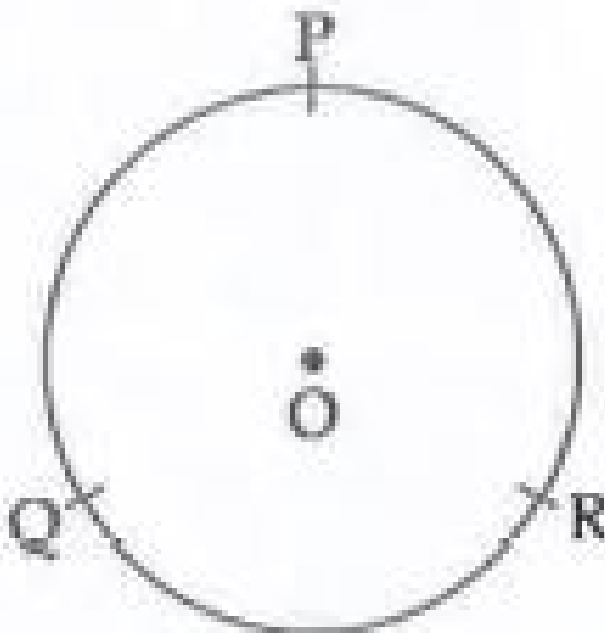
Find the length of the direct common tangent segment to these circles.



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

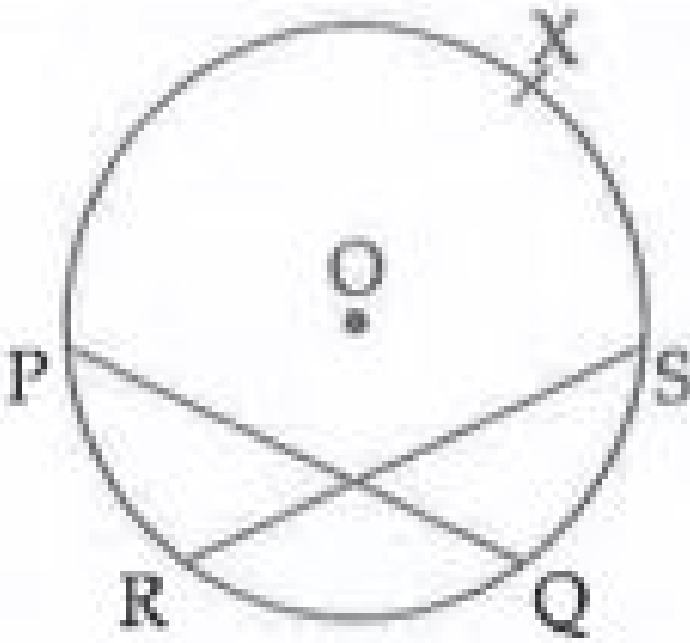
each arc.



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

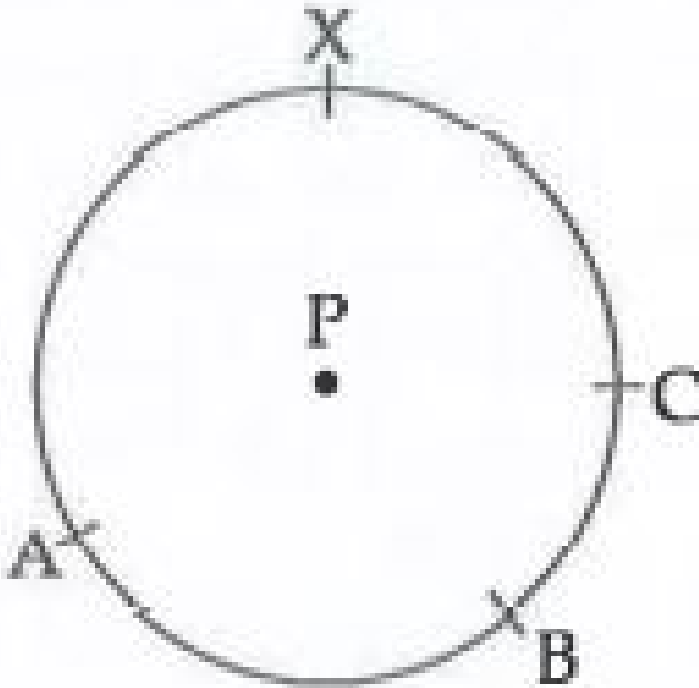
RXS)



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

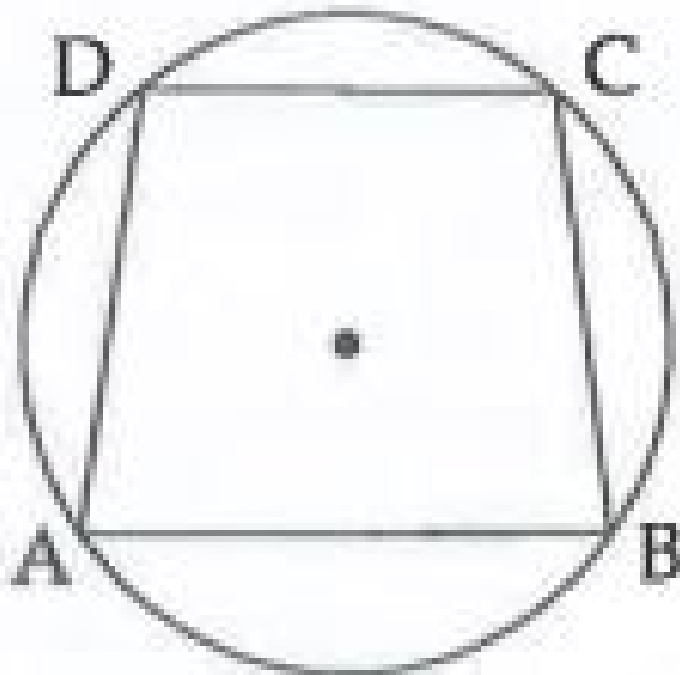
BC and arc AXC.



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34. In the adjoining figure, chord $AD \cong$ Chord BC . $m(\text{arc}ADC) = 100^\circ$, $m(\text{arc}CD) = 60^\circ$.

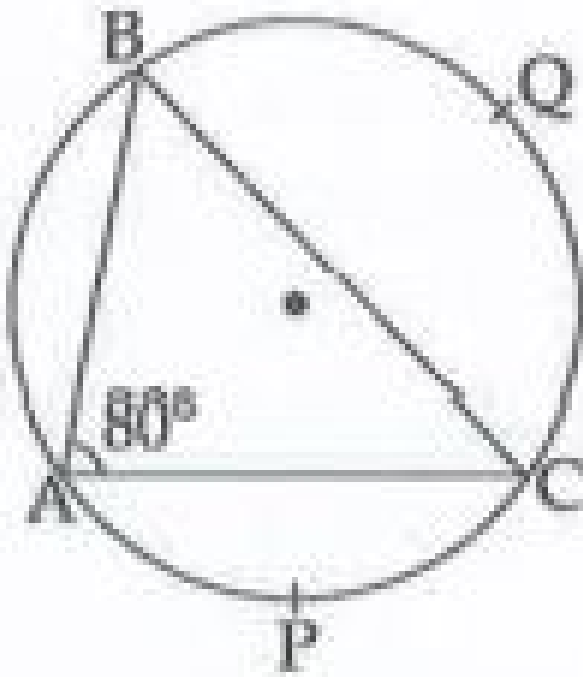
Find $m(\text{arc } AB)$ and $m(\text{arc } BC)$.



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

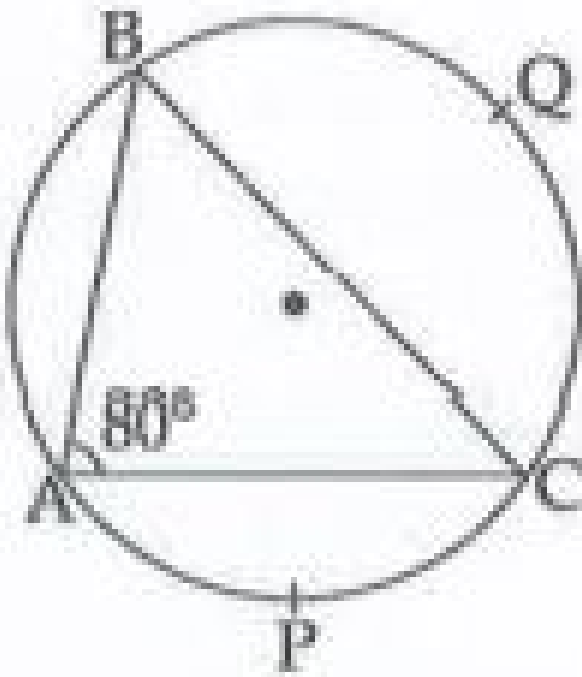
Find $\angle ABC$



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

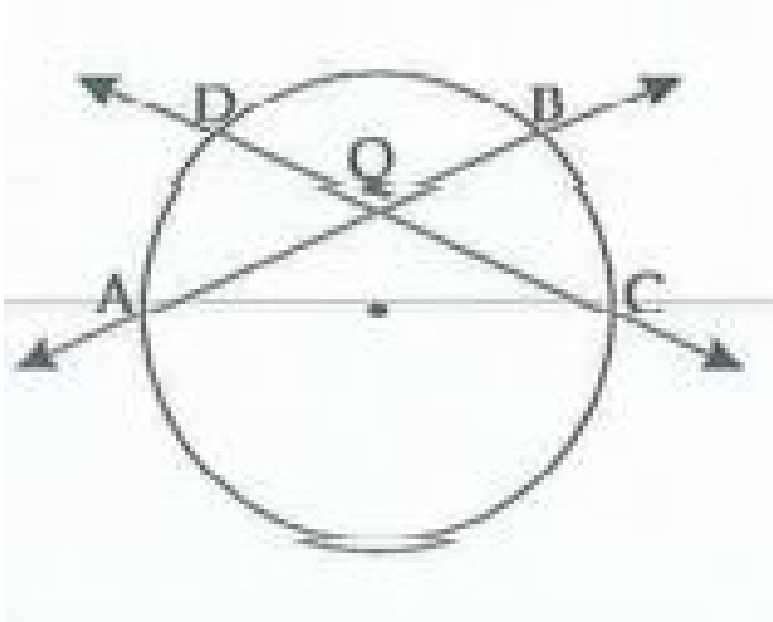
Find $m(\text{arc } BQC)$.



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37. Chords AB and CD of a circle intersect in point Q in the interior of a circle of as shown in the figure. If $m(\text{arc AD}) = 20^\circ$, and

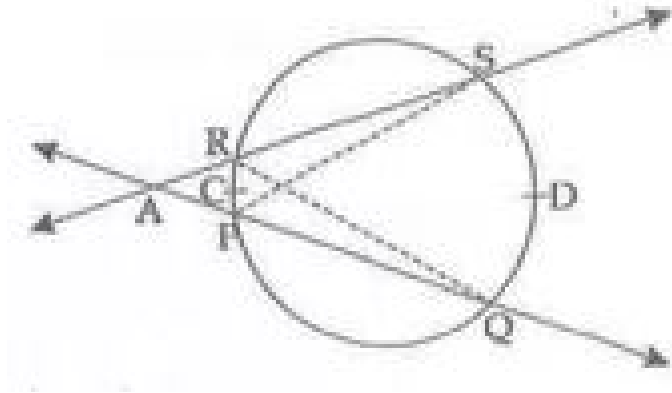
$m(\text{arc}BC) = 36^\circ$, then find $\angle BQC$



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38. Secants containing chords RS and PQ of a circle intersect each other in point A in the exterior of a circle. If $m(\text{arc}PCR) = 26^\circ$ and

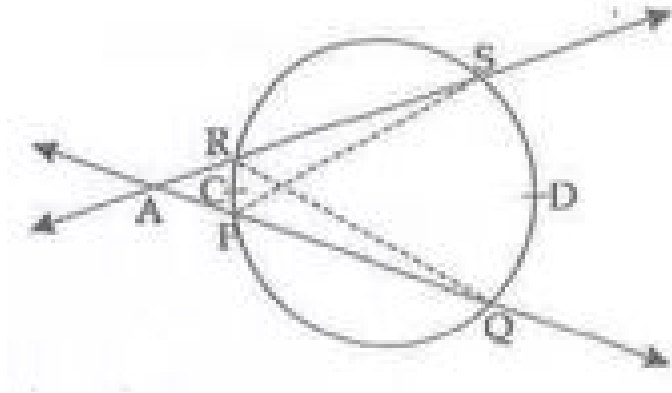
$m(\text{arc}QDS) = 48^\circ$, then find $\angle AQR$



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39. Secants containing chords RS and PQ of a circle intersect each other in point A in the exterior of a circle. If $m(\text{arc}PCR) = 26^\circ$ and

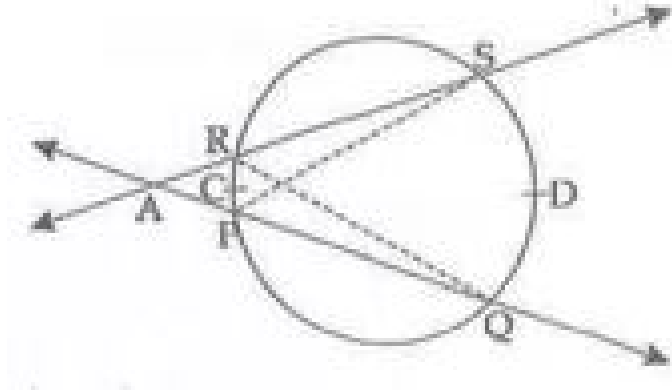
$m(\text{arc}QDS) = 48^\circ$, then find $m\angle SPQ$



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40. Secants containing chords RS and PQ of a circle intersect each other in point A in the exterior of a circle. If $m(\text{arc}PCR) = 26^\circ$ and

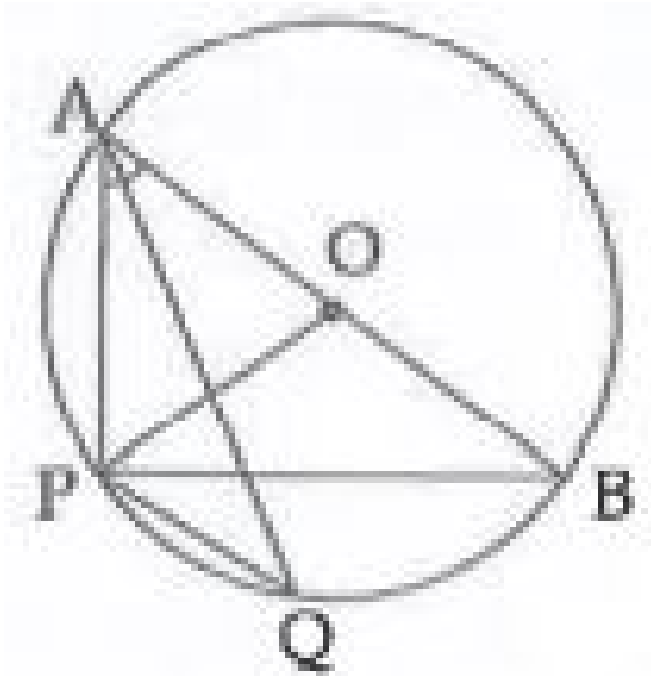
$m(\text{arc } QDS) = 48^\circ$, then find $m\angle RAQ$



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41. In the adjoining figure, O is the centre of the circle. Find the value of $\angle ABP$ if

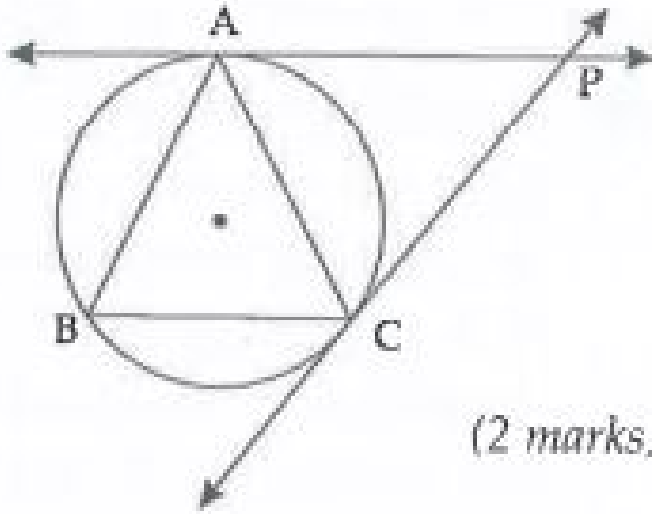
$$\angle POB = 90^\circ.$$



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42. Tangents drawn at point A and C of a circle intersect each other in point P. If

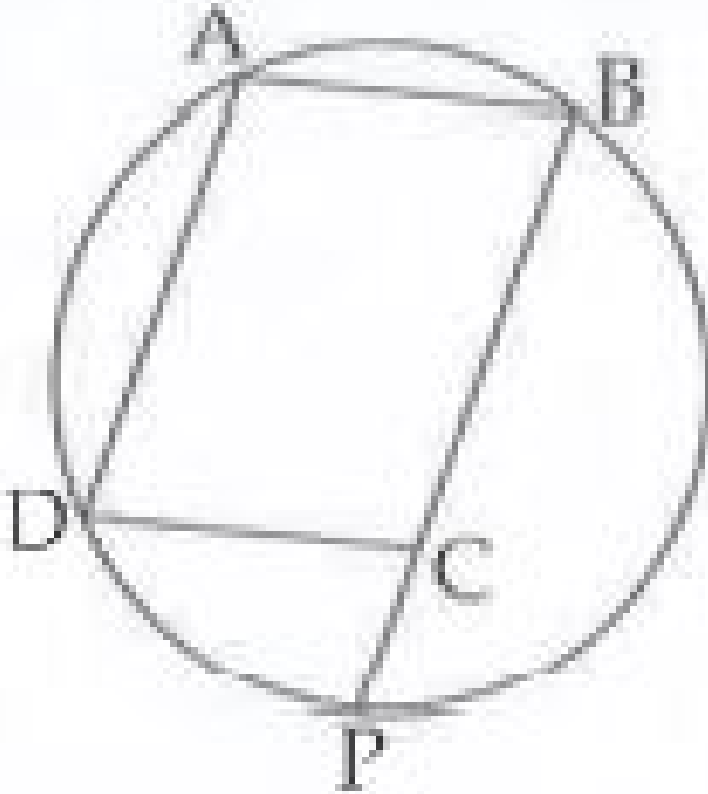
$\angle APC = 50^\circ$, then find $\angle ABC$



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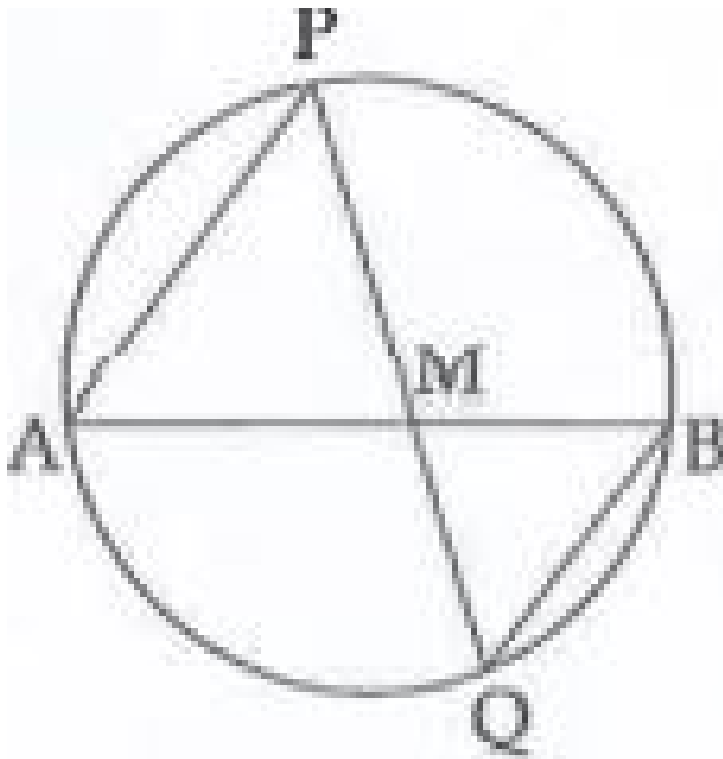
43. $\square ABCD$ is a parallelogram. Side BC intersects circle at point P . Prove that

$$DC = DP$$



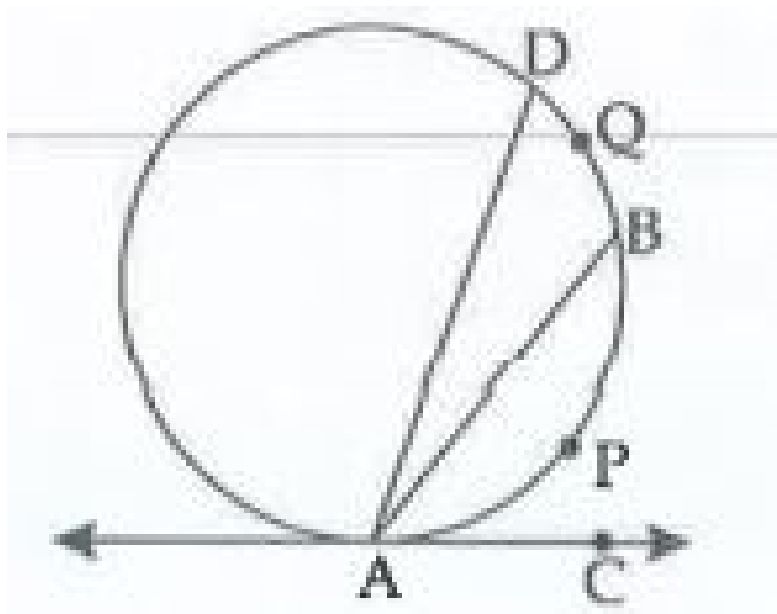
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44. In the adjoining figure, chord PQ and chord AB intersect at point M . If $PM = AM$, then prove that $BM = QM$.



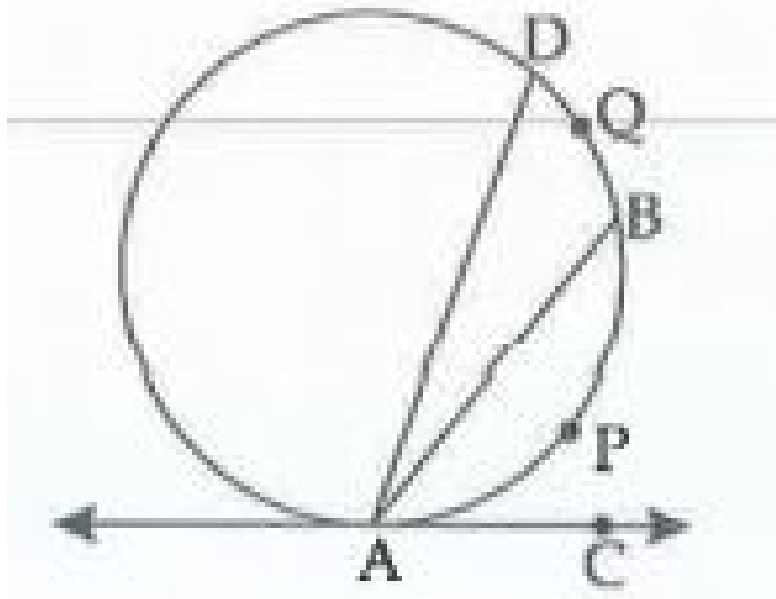
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45. Seg AB and seg AD are the chords of the circle. C is a point on tangent of the circle at point A. If $m(\text{arc}APB) = 80^\circ$ and $\angle BAD = 30^\circ$. Then find $m\angle BAC$



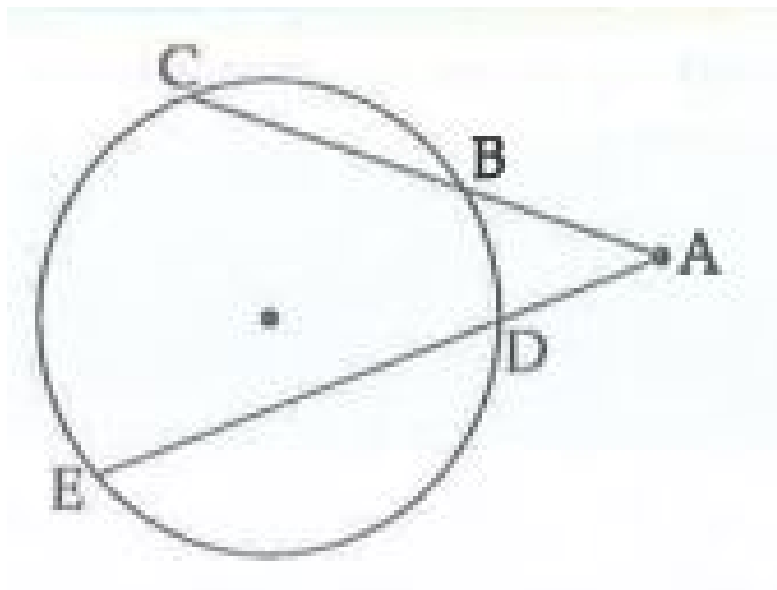
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46. Seg AB and seg AD are the chords of the circle. C is a point on tangent of the circle at point A. If $m(\text{arc } APB) = 80^\circ$ and $\angle BAD = 30^\circ$, then find $m(\text{arc } BQD)$.



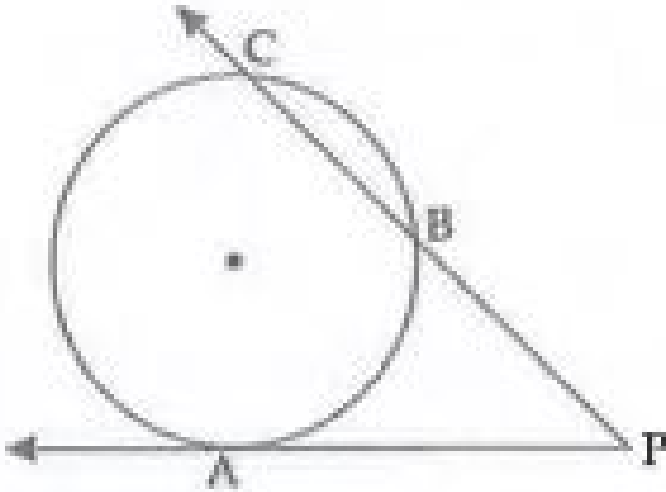
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47. Secant AC and secant AE intersects in point A. Points of intersections of the circle and secants are B and D respectively. If $CB=5$, $AB=7$, $EA=20$. Determine $ED-AD$.



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



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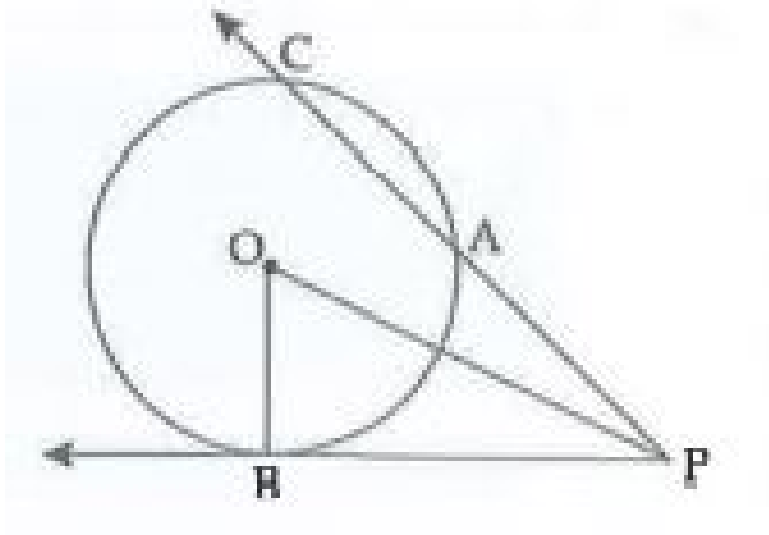
49. $\square ABCD$ is a rectangle. Taking AD as a diameter, a semicircle AXD is drawn which intersects the diagonal BD at X. If AB=12 cm, AD=9 cm, then find values of BD and BX.



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50. 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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51. Radius of a circle with centre 'O' is 5 cm, $OA=4$ cm, $OB=5.5$ cm. Find the position of point A and B with respect to circle.





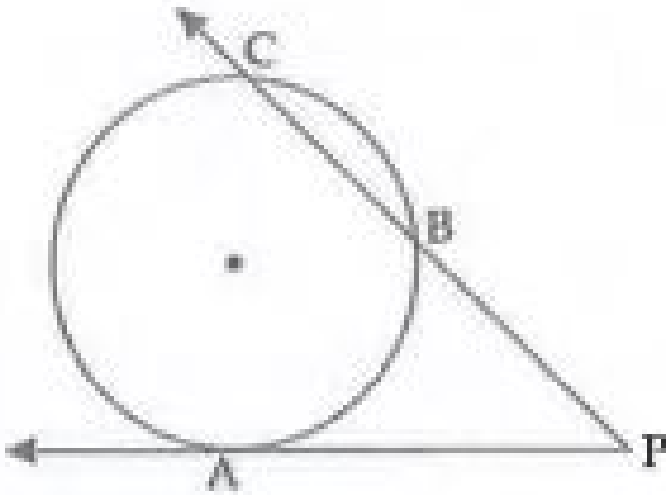
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52. Two circles with diameters 6 cm and 9 cm touch each other externally. Find the distance between their centres.



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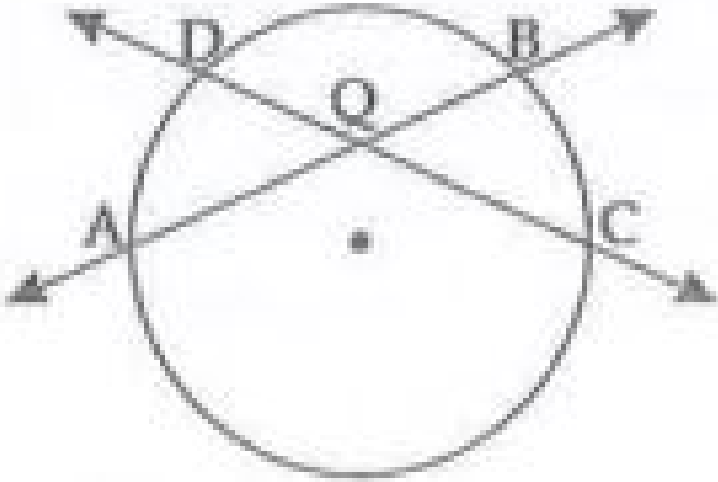
53. Line PA is a tangent at point A. Line PBC is a secant $AP=15, BP=10$, find BC.



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54. Secants AB and CD are intersecting in point Q. $m(\text{arc}AD) = 25^\circ$ and

$m(\text{arc } BC) = 36^\circ$, then find $\angle BQC$



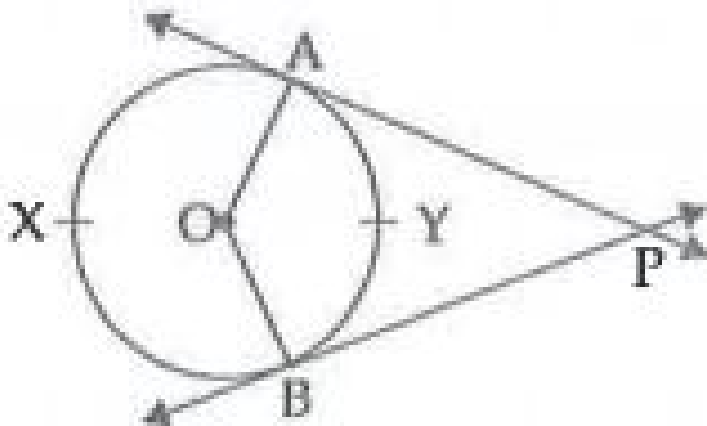
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55. Measure of a major arc of a circle is four times the measure of corresponding minor arc. Find the measure of each arc.



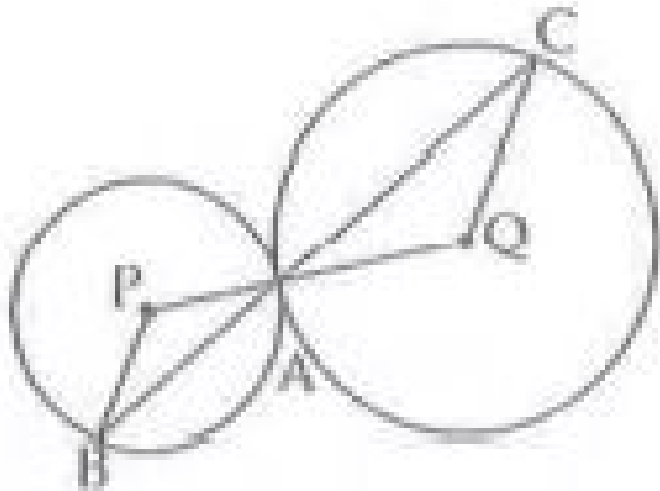
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56. Line PA and line PB are tangents to the circle at points A and B. If $\angle APB = 60^\circ$, then find $m(\text{arc } AXB)$.



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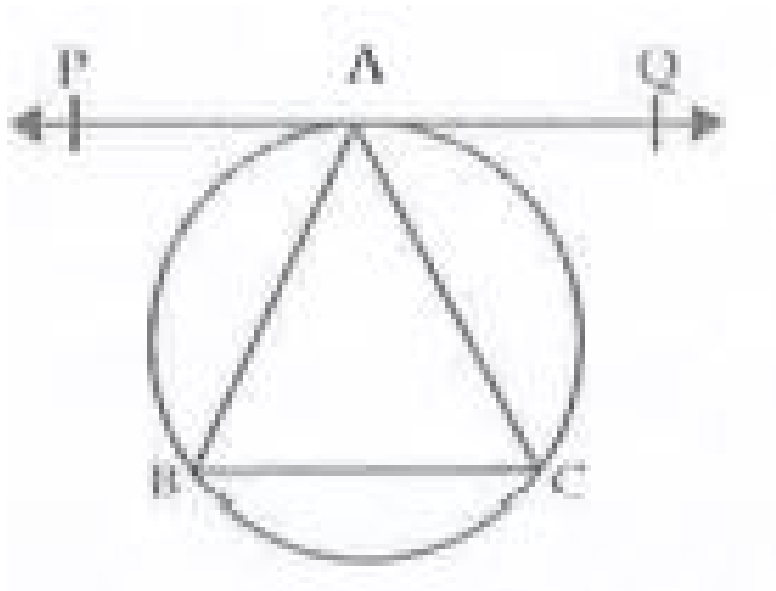
57. Two circles with centres P and Q touch each other at point A. $\angle BPA = 60^\circ$. Find $m\angle QCA$.



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58. Line PQ is a tangent to the circle at point A, $\text{arc}AB \cong \text{arc}AC$. Prove that $\triangle ABC$ is

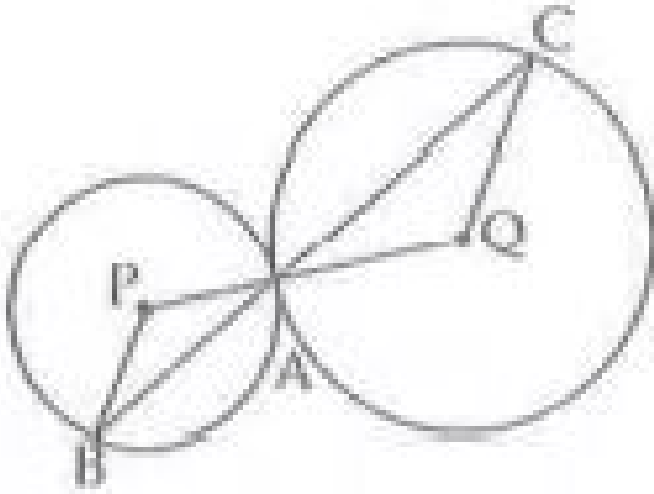
isosceles triangle.



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

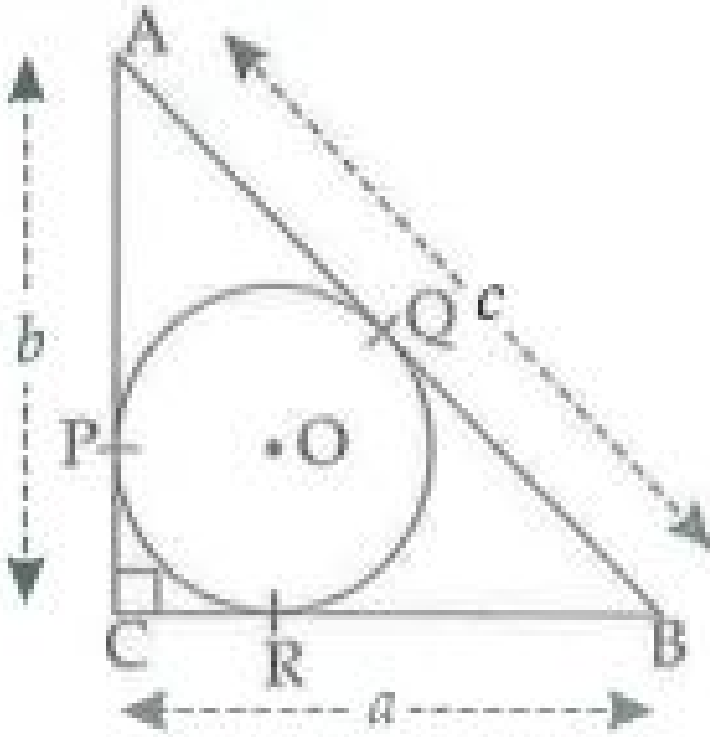
$m\angle CQP.$



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60. A circle with centre 'O' is incircle of $\triangle ABC$. $\angle ACB = 90^\circ$. Radius of the circle

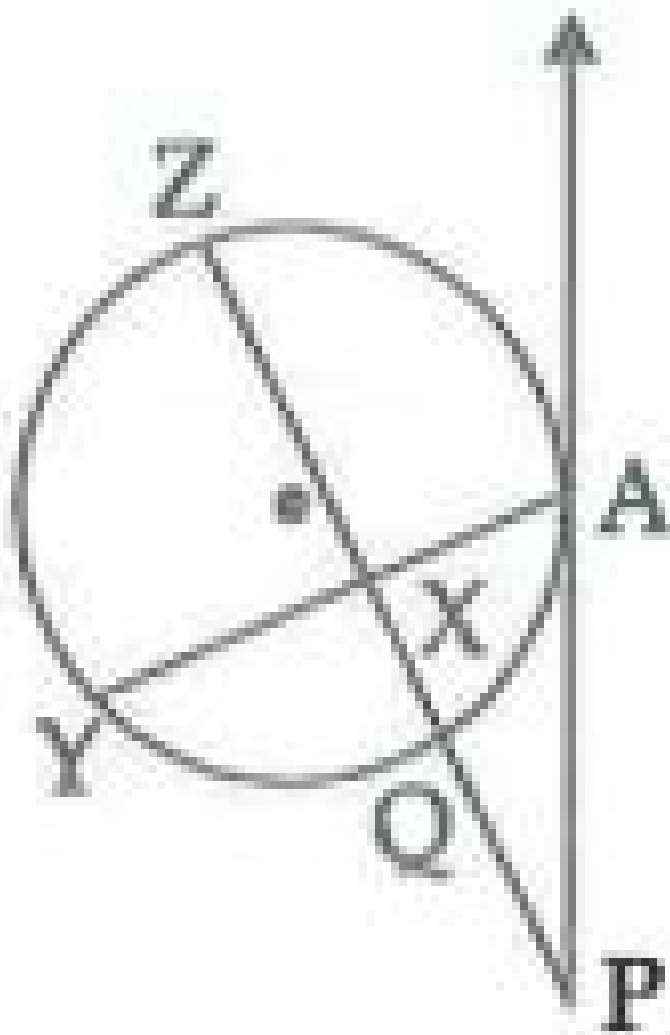
is r . Prove that: $2r = a + b - c$.



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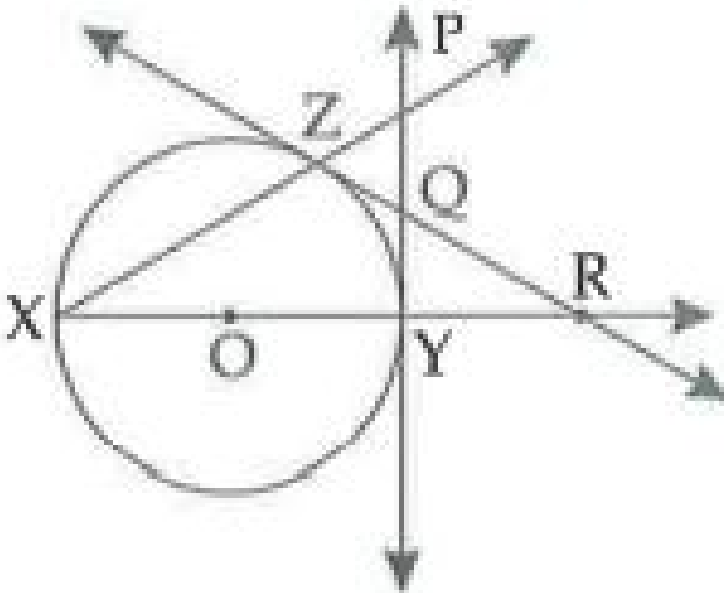
61. In the adjoining figure line PA is a tangent to the circle at point A . Secant PQZ intersects chord AY in point X, such that $AP = PX = XY$. If

$PQ = 1$ and $QZ = 8$. Find AX .



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62. 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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