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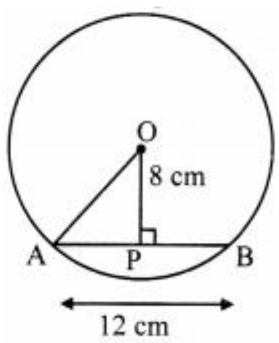
# Practice Set 6.1 Geometry 9th Std Maths Part 2 Answers Chapter 6 Circle

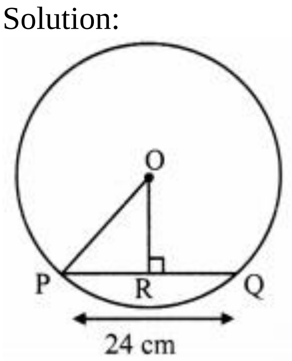
Question 1.
Distance of chord AB from the centre of a circle is 8 cm. Length of the chord AB is 12 cm. Find the diameter of a circle.
Given: In a circle with centre O,
OA is radius and AB is its chord,
seg OP ⊥ chord AB, A-P-B
AB = 12 cm, OP =8 cm
To Find: Diameter of the circle
Solution:




i. AP = 12 AB [Perpendicular drawn from the centre of a circle to the chord bisects the chord.]
∴ AP = 12 x 12 = 6 cm ….(i)
ii. In ∆OPA, ∠OPA = 90°
∴ $OA^2 = OP^2 + AP^2$ [Pythagoras theorem]
$= 8^2 + 6^2$ [From (i)]
= 64 + 36
∴ $OA^2 = 100$
∴ OA = 100−−−√ [Taking square root on both sides]
= 10 cm
iii. Radius (r) = 10 cm
∴ Diameter = 2r = 2 x 10 = 20 cm
∴ The diameter of the circle is 20 cm.



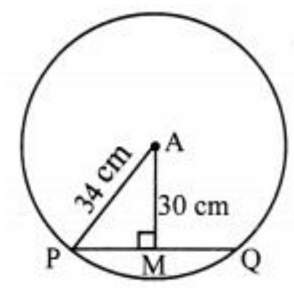
Question 2.
Diameter of a circle is 26 cm and length of a chord of the circle is 24 cm. Find the distance of the chord from the centre.
Solution:



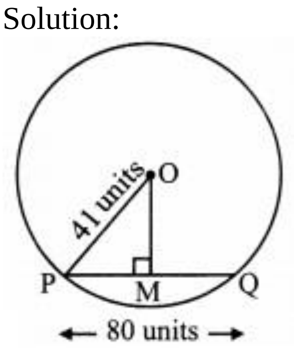

Given: In a circle with centre O,
PO is radius and PQ is its chord,
seg OR ⊥ chord PQ, P-R-Q
PQ = 24 cm, diameter (d) = 26 cm
To Find: Distance of the chord from the centre (OR)
Solution:
Radius (OP) = d2 = 262 = 13 cm ……(i)
∴ PR = 12 PQ [Perpendicular drawn from the centre of a circle to the chord bisects the chord.]
= 12 x 24 = 12 cm …..(ii)
ii. In ∆ORP, ∠ORP = 90°
∴ $OP^2= OR^2 + PR^2$ [Pythagoras theorem]
∴ $13^2 = OR^2 + 12^2$ [From (i) and (ii)]
∴ $169 = OR^2 + 144$
∴ $OR^2 = 169 – 144$
∴ $OR^2 = 25$
∴ OR = $\sqrt{25}$ = 5 cm [Taking square root on both sides]
∴ The distance of the chord from the centre of the circle is 5 cm.

Question 3.
Radius of a circle is 34 cm and the distance of the chord from the centre is 30 cm, find the length of the chord.
Given: in a circle with centre A,
PA is radius and PQ is chord,
seg AM ⊥ chord PQ, P-M-Q
AP = 34 cm, AM = 30 cm
To Find: Length of the chord (PQ)

Solution:

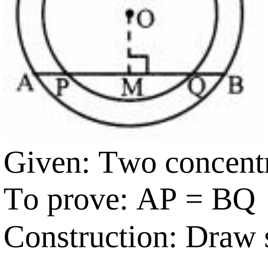



I. In ΔAMP, ∠AMP = 90°
∴ $AP^2 = AM^2 + PM^2$ [Pythagoras theorem]
$34^2 = 30^2 + PM^2$
∴ $PM^2 = 34^2 – 30^2$
∴ $PM^2$ (34 – 30)(34 + 30) [$a^2 – b^2 = (a – b)(a + b)$]
= 4 x 64
∴ PM = $\sqrt{4 \times 64}$ ………(i) [Taking square root on both sides]
= 2 x 8 = 16cm
ii. Now, PM = 12(PQ) [Perpendicular drawn from the centre of a circle to the chord bisects the chord.]
16 = 12(PQ) [From (i)]
∴ PQ = 16 x 2
= 32cm
∴ The length of the chord of the circle is 32cm.
Question 4.
Radius of a circle with centre O is 41 units. Length of a chord PQ is 80 units, find the distance of the chord from the centre of the circle.
Given: In a circle with centre O,
OP is radius and PQ is its chord,
seg OM ⊥ chord PQ, P-M-Q
OP = 41 units, PQ = 80 units,
To Find: Distance of the chord from the centre of the circle(OM)
Solution:



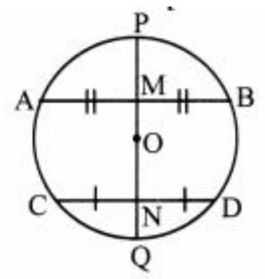

i. 12PM = (PQ) [Perpendicular drawn from the centre of a circle to the chord bisects the chord.]
= 12(80) = 40 Units ….(i)
ii. In ΔOMP, ∠OMP = 90°
∴ $OP^2 = OM^2 + PM^2$ [Pythagoras theorem]
∴ $41^2 = OM^2 + 40^2$ [From (i)]
∴ $OM^2 = 41^2 – 40^2$
= (41 -40) (41 +40) [$a^2 – b^2 = (a – b) (a + b)$]
= (1)(81)
∴ $OM^2 = 81$ OM = $\sqrt{81}$ = 9 units [Taking square root on both sides] [From (i)]
∴ The distance of the chord from the centre of the circle is 9 units.

Question 5.
In the adjoining figure, centre of two circles is O. Chord AB of bigger circle intersects the smaller circle in points P and Q. Show that AP = BQ.




Given: Two concentric circles having centre O.
To prove: AP = BQ
Construction: Draw seg OM ⊥ chord AB, A-M-B
Solution:
Proof:
For smaller circle,
seg OM ⊥ chord PQ [Construction, A-P-M, M-Q-B]
∴ PM = MQ …..(i) [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]
For bigger circle,
seg OM ⊥ chord AB [Construction]
∴ AM = MB [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]
∴ AP + PM = MQ + QB [A-P-M, M-Q-B]
∴ AP + MQ = MQ + QB [From (i)]
∴ AP = BQ

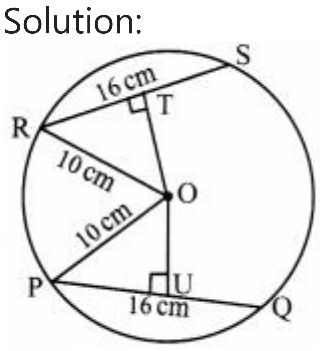
Question 6.
Prove that, if a diameter of a circle bisects two chords of the circle then those two chords are parallel to each other.
Solution:




Given: O is the centre of the circle.
seg PQ is the diameter.
Diameter PQ bisects the chords AB and CD in points M and N respectively.
To prove: chord AB || chord CD.
Proof:
Diameter PQ bisects the chord AB in point M [Given]
∴ seg AM ≅ seg BM
∴ seg OM ⊥ chord AB [Segment joining the centre of a circle and the midpoint of its chord is perpendicular to the chord, P-M-O, O-N-Q]
∴ ∠OMA = 90° …..(i)
Also, diameter PQ bisects the chord CD in point N [Given]
∴ seg CN ≅ seg DN
seg ON ⊥ chord CD [Segment joining the centre of a circle and the midpoint of its chord is perpendicular to the chord, P-M-O, O-N-Q]
∴ ∠ONC = 90° …..(ii)
Now, ∠OMA + ∠ONC = 90° + 90° [From (i) and (ii)]
= 180°
But, ∠OMA and ∠ONC form a pair of interior angles on lines AB and CD when seg MN is their transversal.
∴ chord AB || chord CD [Interior angles test]

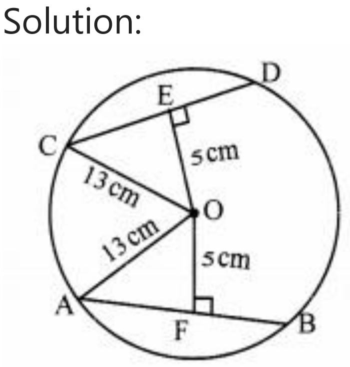
## Practice Set 6.2 Geometry 9th Std Maths Part 2 Answers Chapter 6 Circle

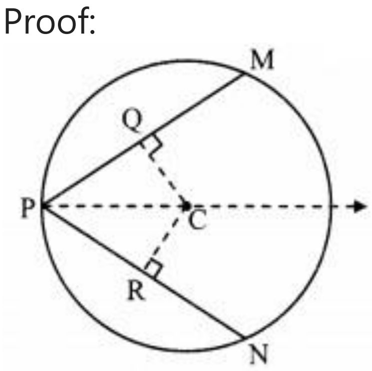
Question 1.
Radius of circle is 10 cm. There are two chords of length 16 cm each. What will be the distance of these chords from the centre of the circle ?
Given: In a circle with centre O,
OR and OP are radii and RS and PQ are its congruent chords.
PQ = RS= 16 cm,
OR = OP = 10 cm
seg OU ⊥ chord PQ, P-U-Q
seg OT ⊥ chord RS, R-T-S
To find: Distance of chords from centre of the circle.
Solution:




i. PU = 12(PQ) [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]
∴ PU= 12 x 16 = 8 cm …(i)
ii. In ΔOUP, ∠OUP = 90°
∴ $OP^2 = OU^2 + PU^2$ [Pythagoras theorem]
∴ $10^2 = OU^2 + 8^2$ [From (i)]
∴ $100 = OU^2 + 64$
∴ $OU^2 = 100 – 64 = 36$
∴ OU = √36 [Taking square root on both sides]
∴ OU = 6 cm

iii. Now, OT = OU [Congruent chords of a circle are equidistant from the centre.]
∴ OT = OU = 6cm
∴ The distance of the chords from the centre of the circle is 6 cm.

Question 2.
In a circle with radius 13 cm, two equal chords are at a distance of 5 cm from the centre. Find the lengths of chords.
Given: In a circle with cente O,
OA and OC are the radii and AB and CD are its congruent chords,
OA = OC = 13cm
0E = OF = 5 cm
seg 0E ⊥ chord CD, C-E-D
seg OF ⊥ chord AB. A-F-B
To find: length of the chords
Solution:


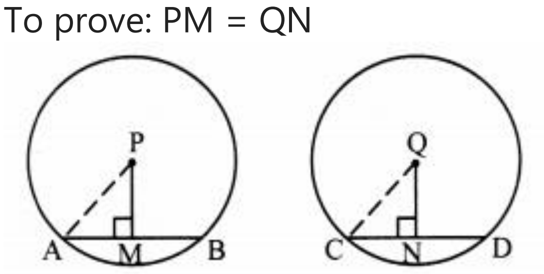
i. In ΔAFO, ∠AFO = 90°
∴ $AO^2 = AF^2 + FO^2$ [Pythagoras theorem]
∴ $13^2 = AF^2 + 5^2$
∴ $169 = AF^2 + 25$
∴ $AF^2 = 169-25$
∴ $AF^2 = 144$
∴ AF = $\sqrt{144}$ [Taking square root on both sides]
∴ AF = 12 cm .....(i)
ii. Now AF = $\frac{1}{2}$AB [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]
∴ 12 = $\frac{1}{2}$ (AB) [From (i)]
∴ AB = 12 x 2 = 24 cm
∴ CD = AB = 24 cm [chord AB ≅ chord CD]
∴ The lengths of the two chords are 24 cm each.
Question 3.
Seg PM and seg PN are congruent chords of a circle with centre C. Show that the ray PC is the bisector of ∠NPM.
Given: Point C is the centre of the circle.
chord PM ≅ chord PN
To prove: Ray PC is the bisector of ∠NPM.
Construction: Draw seg CR ⊥ chord PN, P-R-N
seg CQ ⊥ chord PM, P-Q-M
Proof:


chord PM chord PN [Given]
seg CR ⊥ chord PN
seg CQ ⊥ chord PM [Construction]
∴ segCR ≅ segCQ ....(i) [Congruent chords are equidistant from the centre]
In ΔPRC and ΔPQC,
∠PRC ≅ ∠PQC [Each is of 90°]
segCR ≅ segCQ [From (i)]

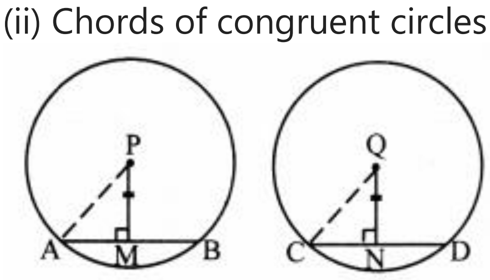
seg PC ≅ seg PC [Common side]
∴ ΔPRC ≅ ΔPQC [Hypotenuse side test]
∴ ∠RPC ≅ ∠QPC [c. a. c. t.]
∴ ∠NPC ≅ ∠MPC [N- R-P, M-Q-P]
∴ Ray PC is the bisector of ∠NPM.

**Maharashtra Board Class 9 Maths Chapter 6 Circle Practice Set 6.2 Intext Questions and Activities**

Question 1.
Prove the following two theorems for two congruent circles. (Textbook pg. no. 81)
i. Congruent chords in congruent circles are equidistant from their respective centres.
ii. Chords of congruent circles which are equidistant from their respective centres are congruent.
Write 'Given'. 'To prove' and the proofs of these theorems.
Solution:
(i) Congruent chords in congruent circles are equidistant from their respective centres.
Given: Point P and point Q are the centres of congruent circles.
chord AB ≅ chord CD
seg PM ⊥ chord AB, A-M-B
seg QN ⊥ chord CD, C-N-D
To prove: PM = QN




Construction: Draw seg PA and seg QC.
Proof:
seg PM ⊥ chord AB, seg QN ⊥ chord CD [Given]
∴ AM = 12(AB) .........(i) [Perpendicular drawn from the centre of the circle to the
∴ CN = 12(CD) ........(ii) chord bisects the chord.]
But, AB = CD .........(iii) [Given]
∴ AM = CN [From (i), (ii) and (iii)]
i.e., segAM ≅ segCN ....(iv) [Segments of equal lengths]
In ΔPMA and ΔQNC,
∠PMA ≅ ∠QNC [Each is of 90°]
hypotenuse PA ≅ hypotenuse QC [Radii of congruent circles]
seg AM ≅ seg CN [From (iv)]
∴ ΔPMA ≅ ΔQNC [Hypotenuse side test]
∴ segPM ≅ segQN [c. s. c. t.]
∴ PM ≅ QN [Length of congruent segments]
(ii) Chords of congruent circles which are equidistant from their respective centres are congruent.

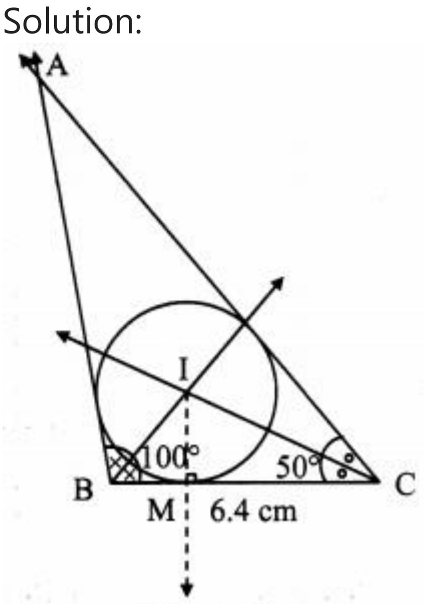



Given: Point P and point Q are the centres of congruent circles.
seg PM ⊥ chord AB, A-M-B
seg QN ⊥ chord CD, C-N-D
PM = QN
To prove: chord AB ≅ chord CD
Construction: Draw seg PA and seg QC.
Proof:
In ΔPMA and ΔQNC,
∴ ∠PMA ≅ ∠QNC [Each is of 90°]
seg PM ≅ seg QN [Given]
hypotenuse PA ≅ hypotenuse QC [Radii of the congruent circles]

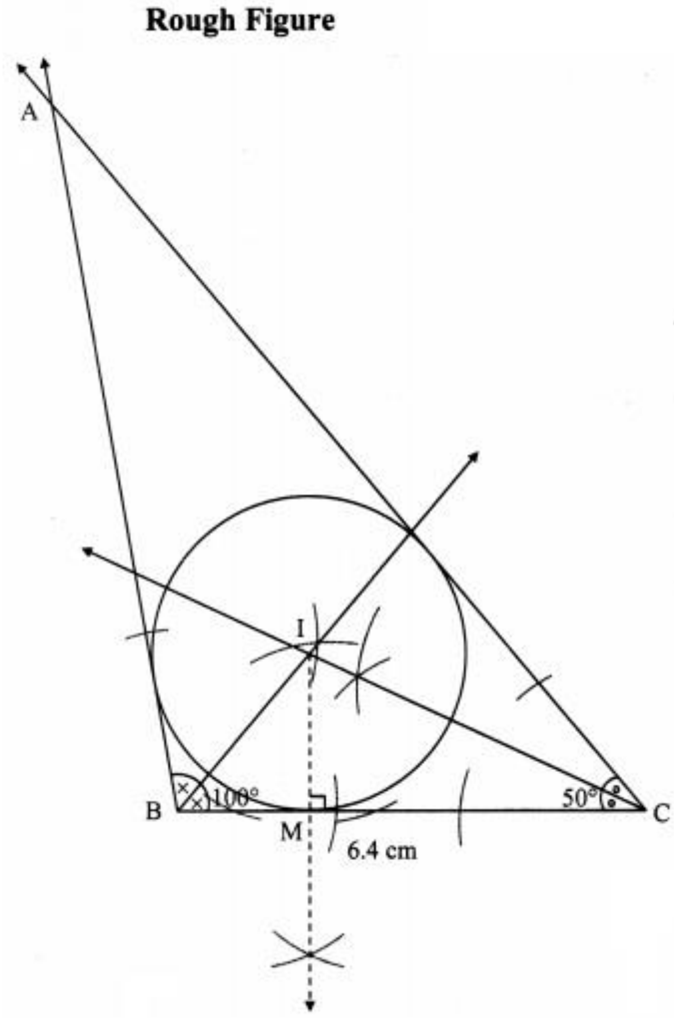
∴ ΔPMA ≅ ΔQNC [Hypotenuse side test]
∴ seg AM ≅ seg CN [c. s. c. t.]
∴ AM = CN ….(i) [Length of congruent segments]
Now, seg PM ⊥ chord AB, and seg QN ⊥ chord CD
∴ AM = 12(AB) …(ii)
∴ CN = 12 (CD) ..(iii) [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]
∴ AB = CD [From (i), (ii) and (ii)]
∴ chord AB ≅ chord CD [Segments of equal lengths]

## Practice Set 6.3 Geometry 9th Std Maths Part 2 Answers Chapter 6 Circle

Question 1.
Construct ΔABC such that ∠B =100°, BC = 6.4 cm, ∠C = 50° and construct its incircle.
Solution:



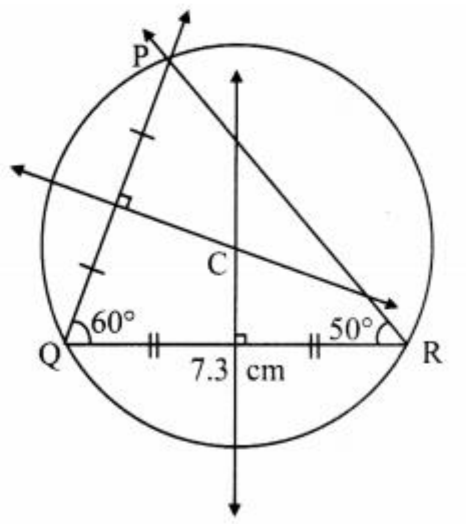
**Rough Figure**



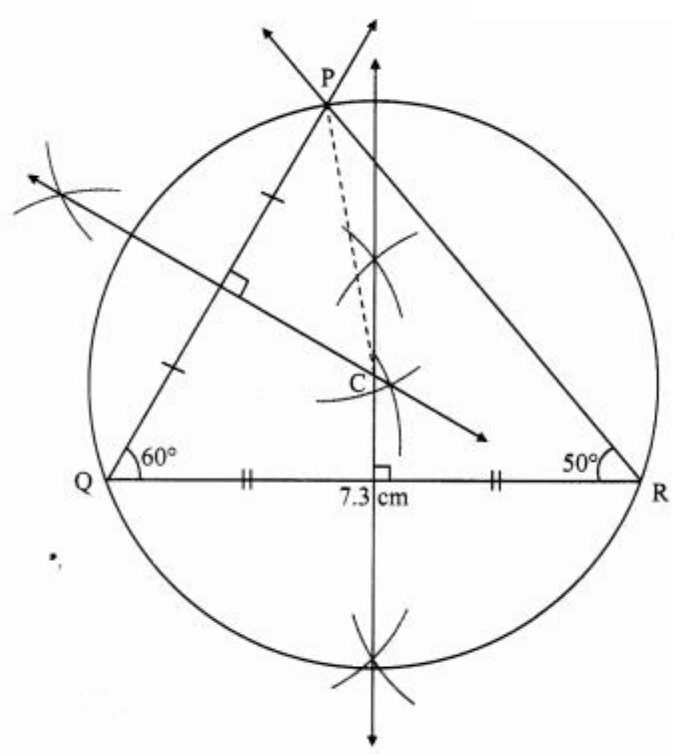

Steps of construction:
i. Construct ΔABC of the given measurement.
ii. Draw the bisectors of ∠B and ∠C. Let these bisectors intersect at point I.
iii. Draw a perpendicular IM on side BC. Point M is the foot of the perpendicular.
iv. With I as centre and IM as radius, draw a circle which touches all the three sides of the triangle.

Question 2.
Construct ΔPQR such that ∠P = 70°, ∠R = 50°, QR = 7.3 cm and construct its circumcircle.

Solution:
In ΔPQR,
m∠P + m∠Q + m∠R = 180° … [Sum of the measures of the angles of a triangle is 180°]
∴ 70° + m∠Q + 50° = 180°
∴ m∠Q = 180° – 70° + m∠Q + 50° = 180°
∴ m∠Q = 180° – 70° – 50°
∴ m∠Q = 60°

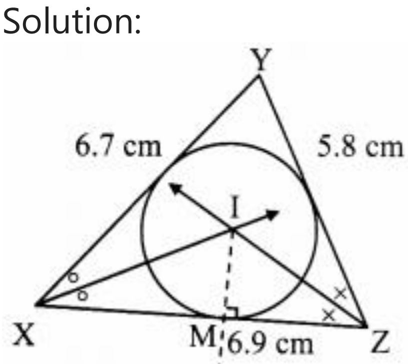


Rough Figure




Steps of construction:
i. Construct A PQR of the given measurement.
ii. Draw the perpendicular bisectors of side PQ and side QR of the triangle.
iii. Name the point of intersection of the perpendicular bisectors as point C.
iv. Join seg CP
v. With C as centre and CP as radius, draw a circle which passes through the three vertices of the triangle.

Question 3.
Construct ΔXYZ such that XY = 6.7 cm, YZ = 5.8 cm, XZ = 6.9 cm. Construct its incircle.
Solution:



Rough Figure

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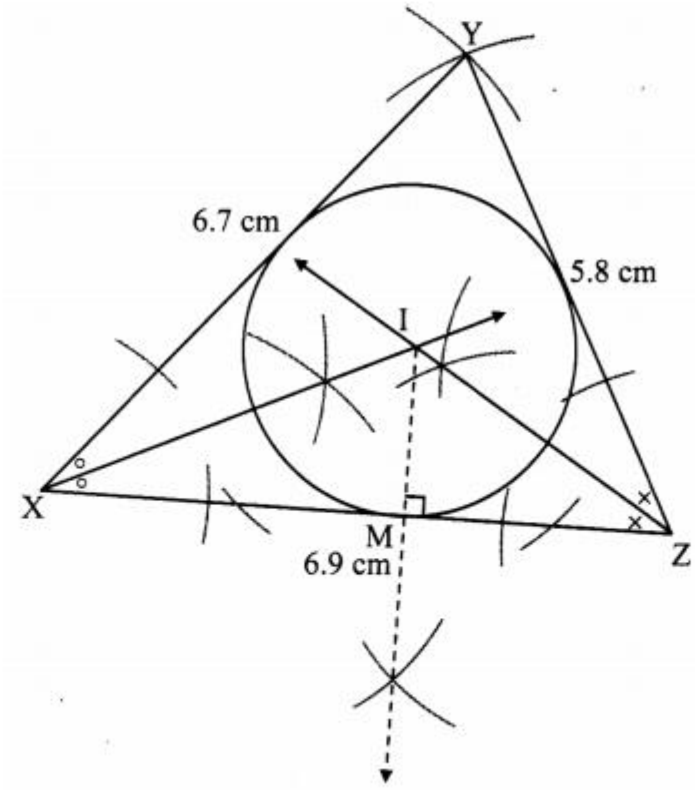
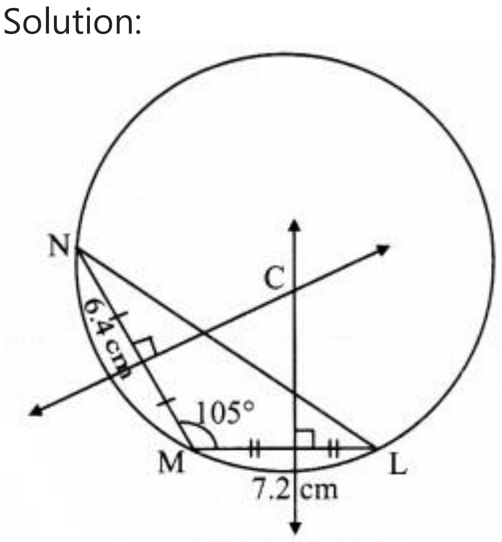



Steps of construction:
i. Construct ΔXYZ of the given measurement
ii. Draw the bisectors of ∠X and ∠Z. Let these bisectors intersect at point I.
iii. Draw a perpendicular IM on side XZ. Point M is the foot of the perpendicular.
iv. With I as centre and IM as radius, draw a circle which touches all the three sides of the triangle.

Question 4.
In ΔLMN, LM = 7.2 cm, ∠M = 105°, MN = 6.4 cm, then draw ΔLMN and construct its circumcircle.
Solution:




Rough Figure

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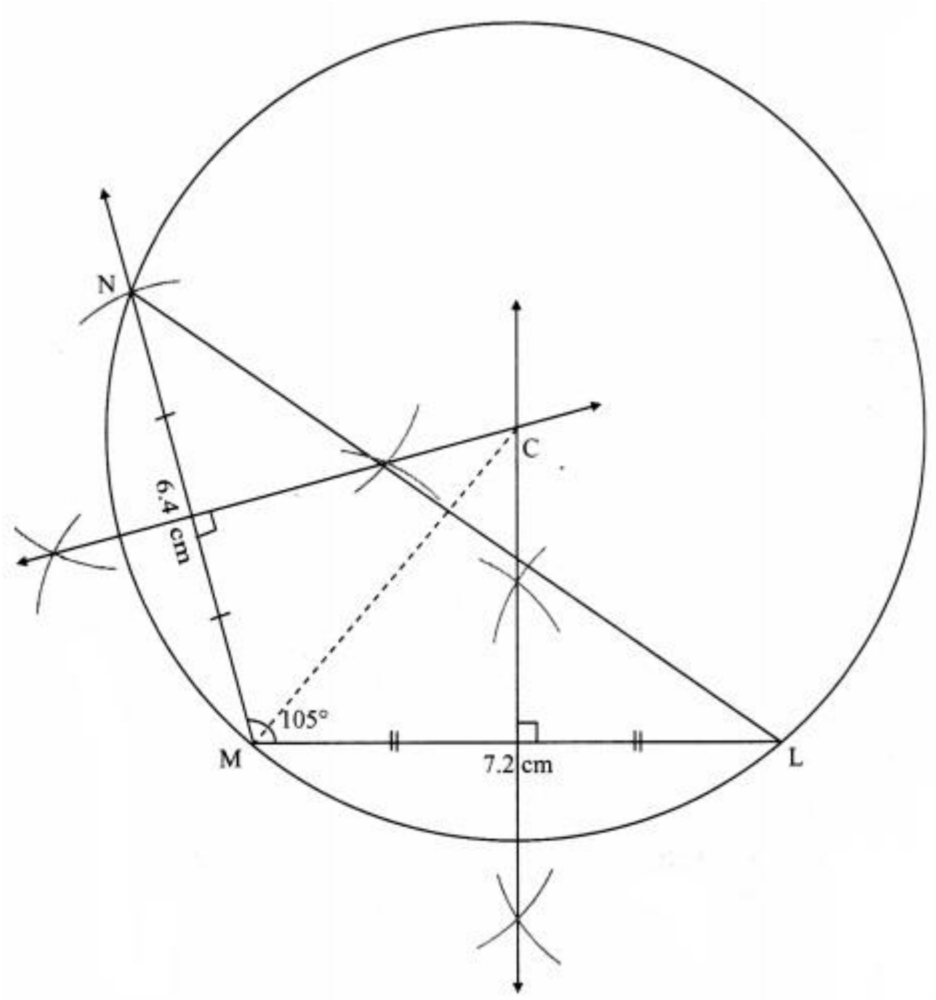
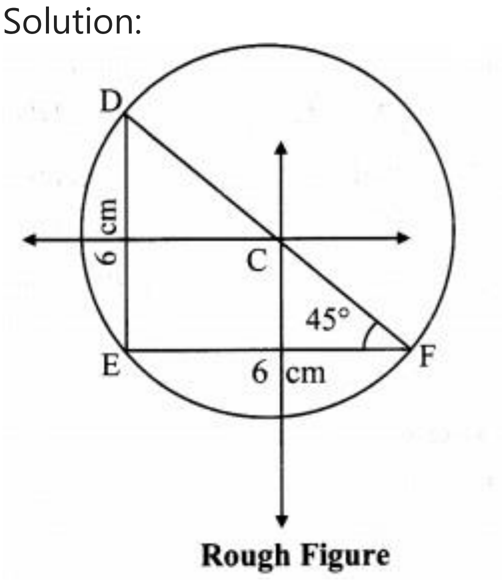



Steps of construction:
i. Construct ΔLMN of the given measurement.
ii. Draw the perpendicular bisectors of side MN and side ML of the triangle.
iii. Name the point of intersection of the perpendicular bisectors as point C.
iv. Join seg CM
v. With C as centre and CM as radius, draw a circle which passes through the three vertices of the triangle.

Question 5.
Construct ΔDEF such that DE = EF = 6 cm. ∠F = 45° and construct its circumcircle.
Solution:



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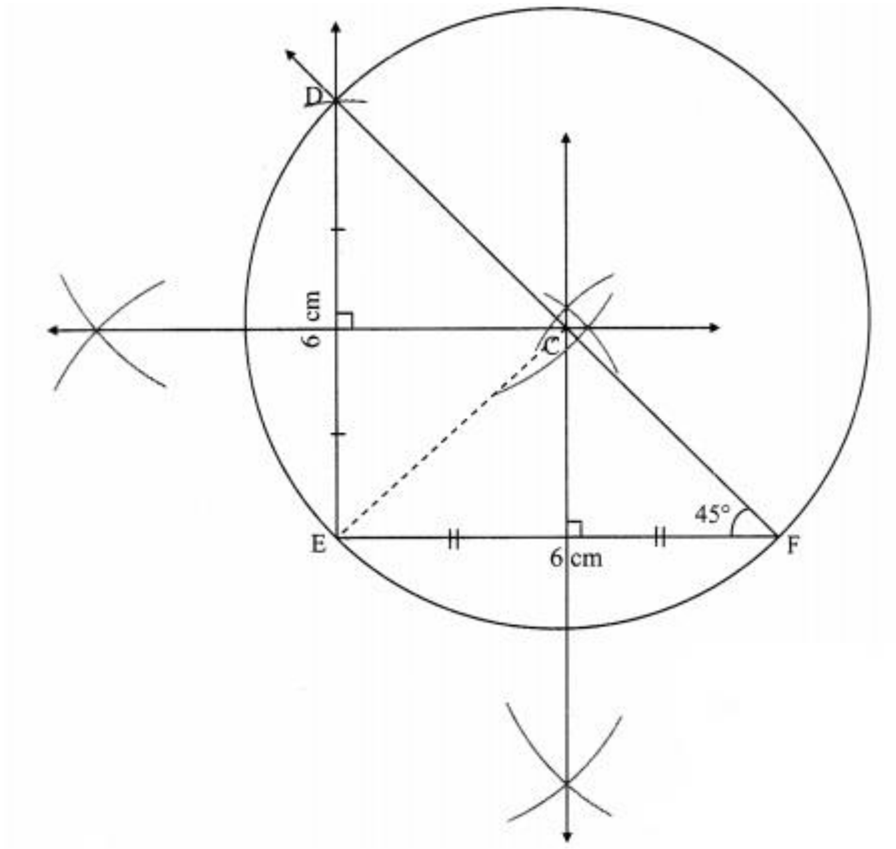
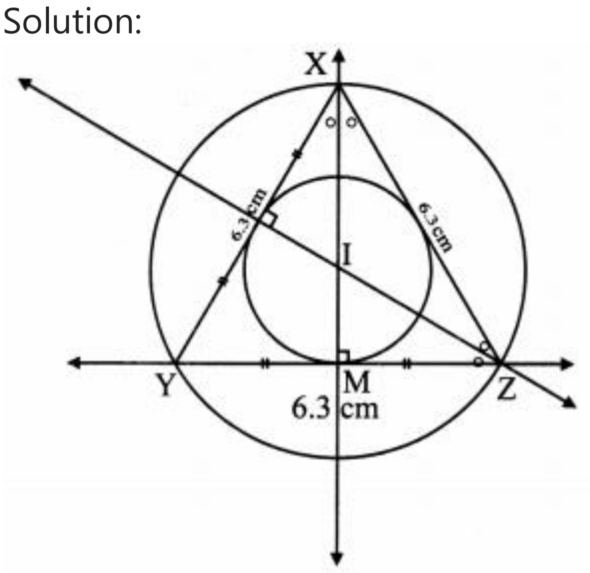


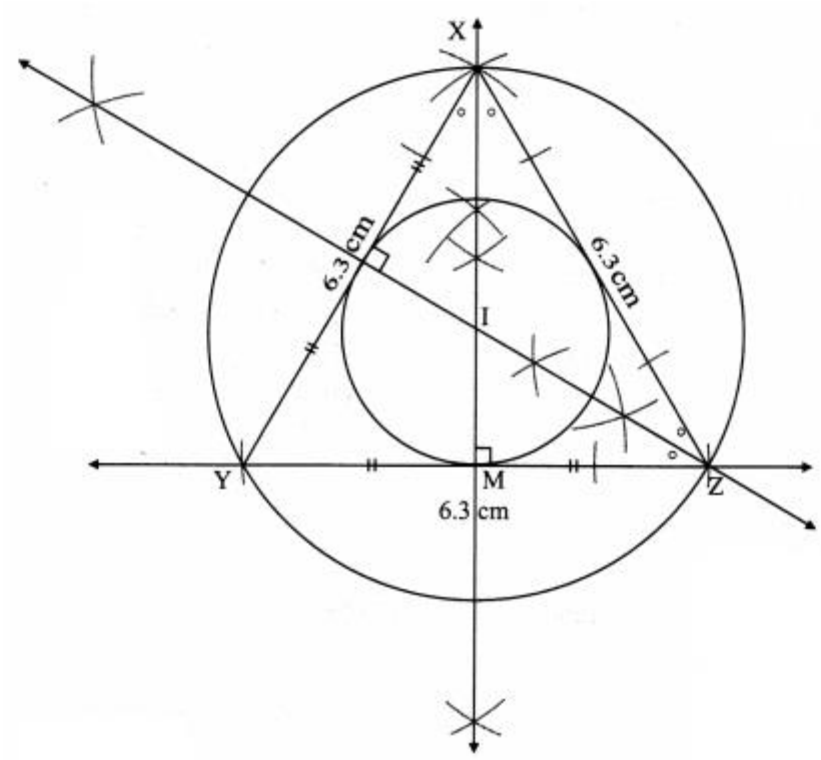

Steps of construction:
i. Construct ΔDEF of the given measurement.
ii. Draw the perpendicular bisectors of side DE and side EF of the triangle.
iii. Name the point of intersection of perpendicular bisectors as point C.
iv. Join seg CE
v. With C as centre and CE as radius, draw a circle which passes through the three vertices of the triangle.

**Maharashtra Board Class 9 Maths Chapter 6 Circle Practice Set 6.3 Intext Questions and Activities**

Question 1.
Draw any equilateral triangle. Draw incircle and circumcircle of it. What did you observe while doing this activity? (Textbook pg. no. 85)
i. While drawing incircle and circumcircle, do the angle bisectors and perpendicular bisectors coincide with each other?
ii. Do the incentre and circumcenter coincide with each other? If so, what can be the reason of it?
iii. Measure the radii of incircle and circumcircle and write their ratio.
Solution:




Rough Figure



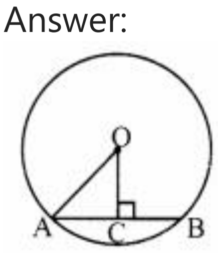

Steps of construction:
i. Construct equilateral ΔXYZ of any measurement.
ii. Draw the perpendicular bisectors of side XY and side YZ of the triangle.
iii. Draw the bisectors of ∠X and ∠Z.
iv. Name the point of intersection of the perpendicular bisectors and angle bisectors as point I.
v. With I as centre and IM as radïus, draw a circle which touches all the three sides of the triangle.
vi. With I as centre and IZ as radius, draw a circle which passes through the three vertices of the triangle.
[Note: Here, point of intersection of perpendicular bisector and angle bisector is same.]

i. Yes.
ii. Yes.
The angle bisectors of the angles and the perpendicular bisectors of the sides of an equilateral triangle are coincedent. Hence, its incentre and circumcentre coincide.
iii. Radius of circumcircle = 3.6 cm,
Radius of incircle = 1.8 cm
Ratio = $\frac{\text{Radius of circumcircle}}{\text{Radius of incircle}} = \frac{3.6}{1.8} = \frac{2}{1} = 2:1$

# Problem Set 6 Geometry 9th Std Maths Part 2 Answers Chapter 6 Circle

Question 1.
Choose correct alternative answer and fill in the blanks.

i. Radius of a circle is 10 cm and distance of a chord from the centre is 6 cm. Hence, the length of the chord is ____.
(A) 16 cm
(B) 8 cm
(C) 12 cm
(D) 32 cm
Answer:




∴ $OA^2 = AC^2 + OC^2$
∴ $10^2 = AC^2 + 6^2$
∴ $AC^2 = 64$
∴ AC = 8 cm
∴ AB = 2(AC)= 16 cm
(A) 16 cm

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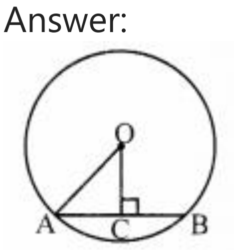
ii. The point of concurrence of all angle bisectors of a triangle is called the ____.
(A) centroid
(B) circumcentre
(C) incentre
(D) orthocentre
Answer:
(C) incentre

iii. The circle which passes through all the vertices of a triangle is called ____.
(A) circumcircle
(B) incircle
(C) congruent circle
(D) concentric circle
Answer:
(A) circumcircle

iv. Length of a chord of a circle is 24 cm. If distance of the chord from the centre is 5 cm, then the radius of that circle is ____.
(A) 12 cm
(B) 13 cm
(C) 14 cm
(D) 15 cm
Answer:


$OA^2 = AC^2 + OC^2$
$\therefore OA^2 = 12^2 + 5^2$
$\therefore OA^2 = 169$
$\therefore OA = 13$ cm
(B) 13 cm

v. The length of the longest chord of the circle with radius 2.9 cm is ____.
(A) 3.5 cm
(B) 7 cm
(C) 10 cm
(D) 5.8 cm
Answer:
Longest chord of the circle = diameter = 2 x radius = 2 x 2.9 = 5.8 cm
(D) 5.8 cm

vi. Radius of a circle with centre O is 4 cm. If l(OP) = 4.2 cm, say where point P will lie ____.
(A) on the centre
(B) inside the circle
(C) outside the circle
(D) on the circle
Answer:
l(OP) > radius
∴Point P lies in the exterior of the circle.
(C) outside the circle

vii. The lengths of parallel chords which are on opposite sides of the centre of a circle are 6 cm and 8 cm. If radius of the circle is 5 cm, then the distance between these chords is _____.
(A) 2 cm
(B) 1 cm
(C) 8 cm

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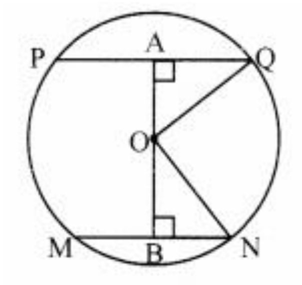
(D) 7 cm

Answer:




PQ = 8 cm, MN = 6 cm

∴ AQ = 4 cm, BN = 3 cm

∴ $OQ^2 = OA^2 + AQ^2$

∴ $5^2 = OA^2 + 4^2$

∴ $OA^2 = 25 - 16 = 9$

∴ OA = 3 cm

Also, $ON^2 = OB^2 + BN^2$

∴ $5^2 = OB^2 + 3^2$

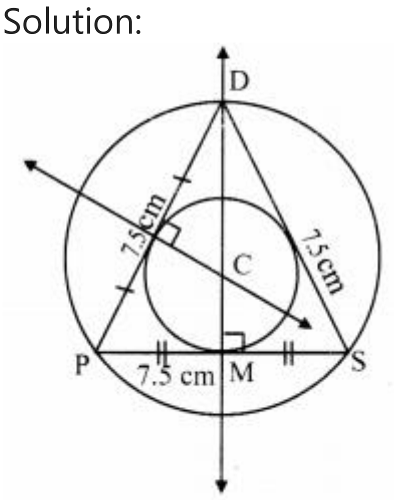
∴ OB = 4 cm

Now, AB = OA + OB = 3 + 4 = 7 cm

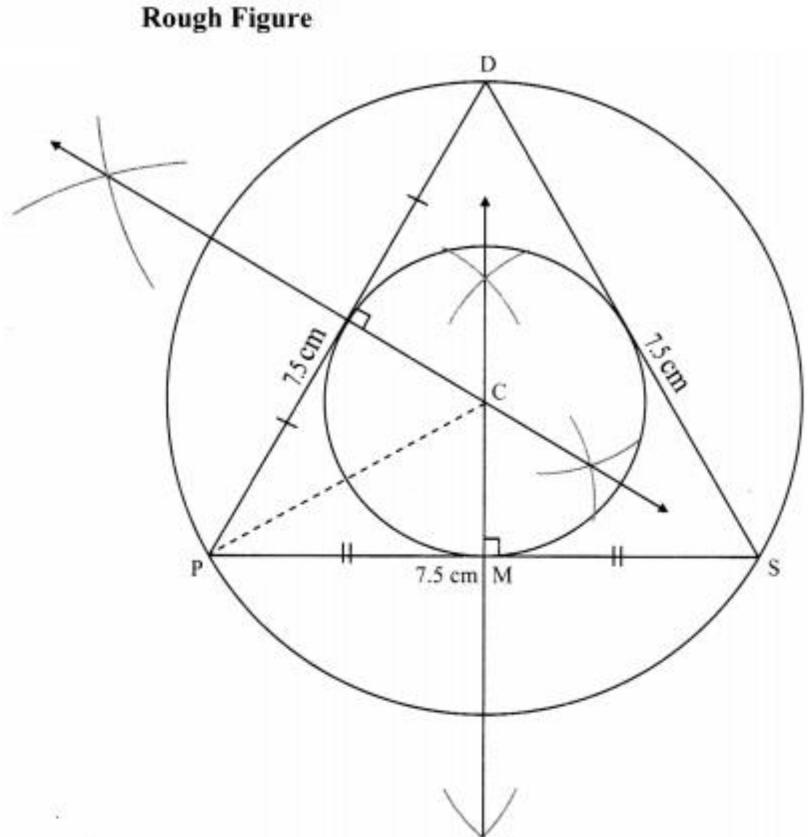
Question 2.

Construct incircle and circumcircle of an equilateral ADSP with side 7.5 cm. Measure the radii of both the circles and find the ratio of radius of circumcircle to the radius of incircle.

Solution:




Rough Figure




Steps of construction:

i. Construct ΔDPS of the given measurement.

ii. Draw the perpendicular bisectors of side DP and side PS of the triangle.

iii. Name the point of intersection of the perpendicular bisectors as point C.

iv. With C as centre and CM as radius, draw a circle which touches all the three sides of the triangle.

v. With C as centre and CP as radius, draw a circle which passes through the three vertices of the triangle.

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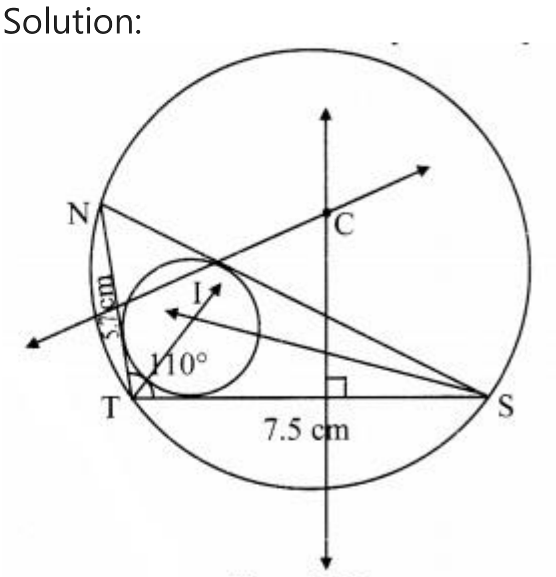
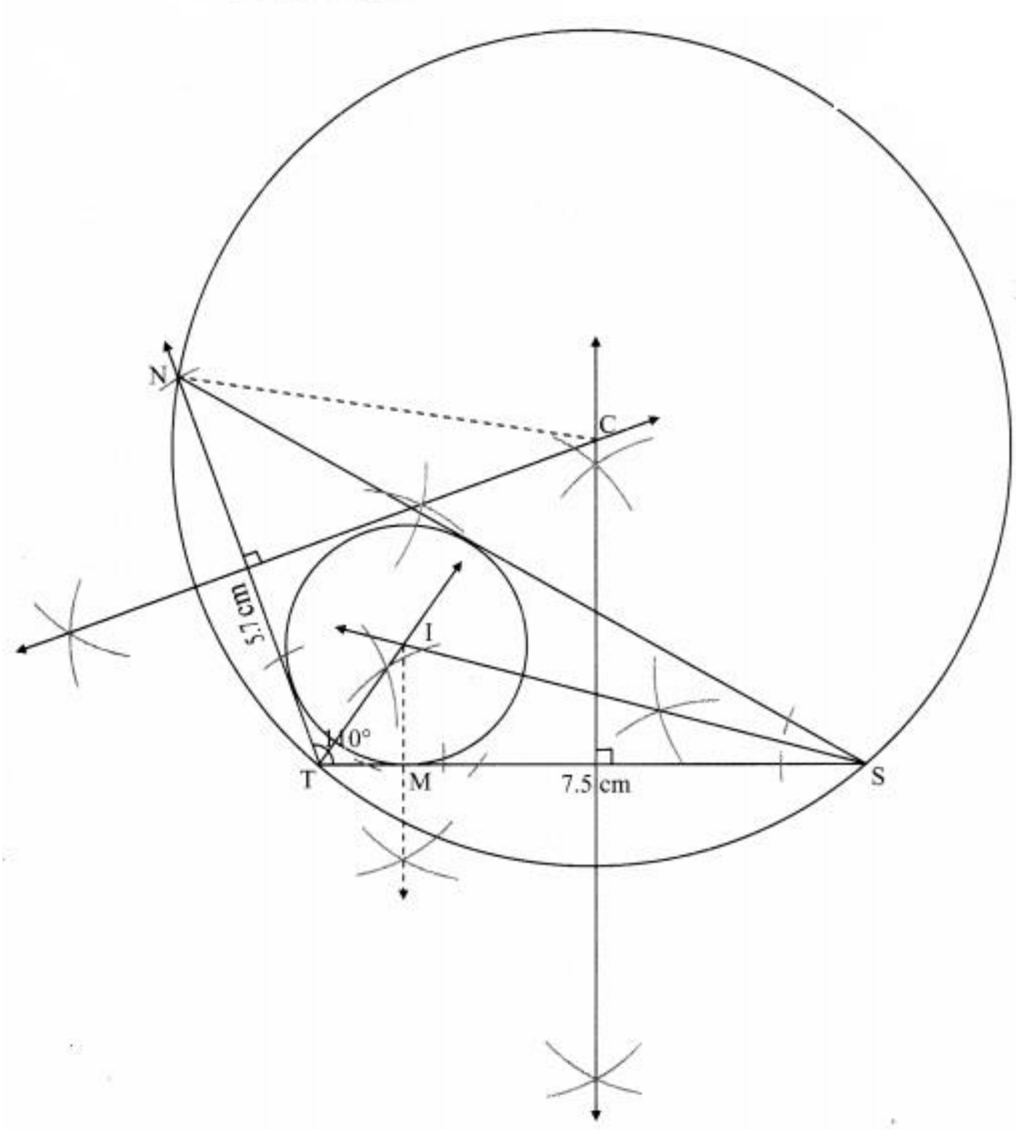
Radius of incircle = 2.2 cm and Radius of circumcircle = 4.4 cm

$$\therefore \quad \frac{\text{Radius of circumcircle}}{\text{Radius of incircle}} = \frac{4.4}{2.2} = \frac{44}{22} = \frac{2}{1} = \mathbf{2:1}$$

Question 3.
Construct ΔNTS where NT = 5.7 cm. TS = 7.5 cm and ∠NTS = 110° and draw incircle and circumcircle of it.
Solution:

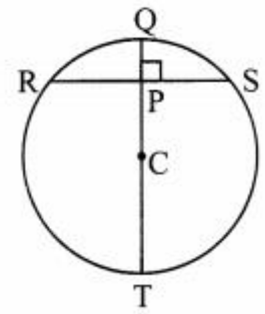


**Rough Figure**

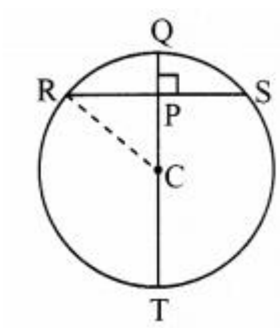



Steps of construction:
For incircle:
i. Construct ΔNTS of the given measurement.
ii. Draw the bisectors of ∠T and ∠S. Let these bisectors intersect at point I.
iii. Draw a perpendicular IM on side TS. Point M is the foot of the perpendicular.
iv. With I as centre and IM as radius, draw a circle which touches all the three sides of the triangle.
For circumcircle:
i. Draw the perpendicular bisectors of side NT and side TS of the triangle.
ii. Name the point of intersection of the perpendicular bisectors as point C.
iii. Join seg CN
iv. With C as centre and CN as radius, draw a circle which passes through the three vertices of the triangle.

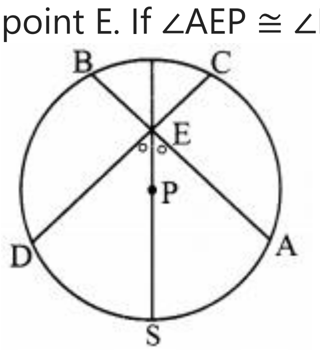
Question 4.
In the adjoining figure, C is the centre of the circle, seg QT is a diameter, CT = 13, CP = 5. Find the length of chord RS.



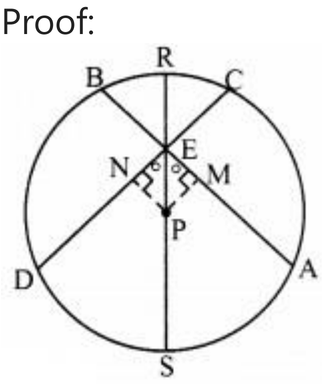

Given: In a circle with centre C, QT is a diameter, CT = 13 units, CP = 5 units
To find: Length of chord RS
Construction: Join points R and C.
Solution:




i. CR = CT= 13 units …..(i) [Radii of the same circle]
In ΔCPR, ∠CPR = 90°
∴ $CR^2 = CP^2 + RP^2$ [Pythagoras theorem]
∴ $13^2 = 5^2 + RP^2$ [From (i)]
∴ $169 = 25 + RP^2$ [From (i)]
∴ $RP^2 = 169 – 25 = 144$
∴ RP = $\sqrt{144}$ [Taking square root on both sides]
∴ RP = 12 cm ….(ii)
ii. Now, seg CP _L chord RS [Given]
∴ RP = $\frac{1}{2}$ RS [Perpendicular drawn from the centre of the circle to the chord bisects the chord.]
∴ 12 = $\frac{1}{2}$ RS [From (ii)]
∴ RS = 2 x 12 = 24
∴ The length of chord RS is 24 units.
Question 5.
In the adjoining figure, P is the centre of the circle. Chord AB and chord CD intersect on the diameter at the point E. If ∠AEP ≅ ∠DEP, then prove that AB = CD.



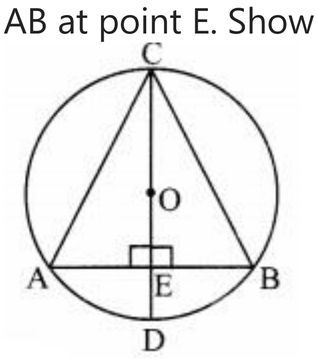

Given: P is the centre of the circle.
Chord AB and chord CD intersect on the diameter at the point E. ∠AEP ≅ ∠DEP
To prove: AB = CD
Construction: Draw seg PM ⊥ chord AB, A-M-B
seg PN ⊥ chord CD, C-N-D
Proof:




∠AEP ≅ ∠DEP [Given]
∴ Seg ES is the bisector of ∠AED.

PoInt P is on the bisector of ∠AED.
∴ PM = PN [Every point on the bisector of an angle is equidistant from the sides of the angle.]
∴ chord AB ≅ chord CD [Chords which are equidistant from the centre are congruent.]
∴ AB = CD [Length of congruent segments]

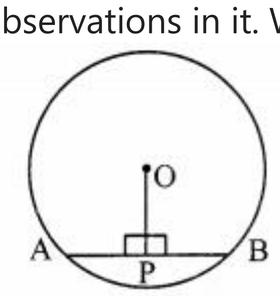
Question 6.
In the adjoining figure, CD is a diameter of the circle with centre O. Diameter CD is perpendicular to chord AB at point E. Show that ΔABC is an isosceles triangle.




Given: O is the centre of the circle.
diameter CD ⊥ chord AB, A-E-B
To prove: ΔABC is an isosceles triangle.
Proof:
diameter CD ⊥ chord AB [Given]
∴ seg OE ⊥ chord AB [C-O-E, O-E-D]
∴ seg AE ≅ seg BE ……(i) [Perpendicular drawn from the centre of the circle to the chord bisects the chord]
In ΔCEA and ΔCEB,
∠CEA ≅ ∠CEB [Each is of 90°]
seg AE ≅ seg BE [From (i)]
seg CE ≅ seg CE [Common side]
∴ ΔCEA ≅ ΔCEB [SAS test]
∴ seg AC ≅ seg BC [c. s. c. t.]
∴ ΔABC is an isosceles triangle.

**Maharashtra Board Class 9 Maths Chapter 6 Circle Problem Set 6 Intext Questions and Activities**

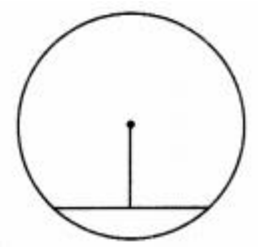
Question 1.
Every student in the group should do this activity. Draw a circle in your notebook. Draw any chord of that circle. Draw perpendicular to the chord through the centre of the circle. Measure the lengths of the two parts of the chord. Group leader should prepare a table as shown below and ask other students to write their observations in it. Write the property which you have observed. (Textbook pg. no. 77)




| Student / Length | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| $l$(AP) | …….. cm | | | | | |
| $l$(PB) | …….. cm | | | | | |

Answer:
On completing the above table, you will observe that the perpendicular drawn from the centre of a circle on its chord bisects the chord.

Question 2.
Every student from the group should do this activity. Draw a circle in your notebook. Draw a chord of the circle. Join the midpoint of the chord and centre of the circle. Measure the angles made by the segment with the chord.
Discuss about the measures of the angles with your friends. Which property do the observations suggest ? (Textbook pg. no. 77)



Answer:
The meausure of the angles made by the drawn segment with the chord is 90°. Thus, we can conclude that, the segment joining the centre of a circle and the midpoint of its chord is perpendicular to the chord.

Question 3.
Draw circles of convenient radii. Draw two equal chords in each circle. Draw perpendicular to each chord from the centre. Measure the distance of each chord from the centre. What do you observe? (Textbook pg. no. 79)
Answer:
Congruent chords of a circle are equidistant from the centre.

Question 4.
Measure the lengths of the perpendiculars on chords in the following figures.

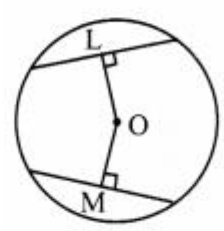


Figure (i)

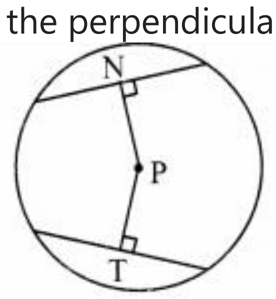


Figure (ii)

Figure (iii)

Did you find OL = OM in fig (i), PN = PT in fig (ii) and MA = MB in fig (iii)?
Write the property which you have noticed from this activity. (Textbook pg. no. 80)
Answer:
In each figure, the chords are equidistant from the centre. Also, we can see that the measures of the chords in each circle are equal.
Thus, we can conclude that chords of a circle equidistant from the centre of a circle are congruent.

Question 5.
Draw different triangles of different measures and draw in circles and circumcircles of them. Complete the table of observations and discuss. (Textbook pg. no. 85)
Answer:

| Type of triangle | Equilateral triangle | Isosceles triangle | Scalene triangle |
|---|---|---|---|
| Position of incentre | Inside the triangle | Inside the triangle | Inside the triangle |
| Position of circumcentre | Inside the triangle | Inside, outside on the triangle | Inside the triangle, outside the triangle or on the triangle |

| Type of triangle | Acute angled triangle | Right angled triangle | Obtuse angled triangle |
|---|---|---|---|
| Position of incentre | Inside the triangle | Inside the triangle | Inside the triangle |
| Position of circumcentre | Inside the triangle | Midpoint of hypotenuse | Outside the triangle |