SHIKSHA CLASSES

Subject : Geometry **Prelim Question Paper - 2** **Marks : 40**

Class : X **Time : 2 Hr.**

Q. 1 A. Choose the correct alternatives. 4

1) If a, b, c are sides of a triangle and $a^2 + b^2 = c^2$ then name the type of triangle.

a) Obtuse angled triangle

b) Acute angled triangle

c) Right angled triangle

d) None of these

2) The measure of an inscribed angle is half of the measure of the ..... intercepted by it.

a) Angle b) Triangle

c) Arc d) side

3) Out of the following which is the Pythagorean triplet?

a) (1, 5, 10) b) (3, 4, 5)

c) (2, 2, 2) d) (5, 5, 2)

4) 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

Q. 1 B. Solve the following questions. 4

1) $\angle ACB$ is inscrised in are ACB of a circle wih centre O. If $\angle ACB = 65^0$ find m[arc(ACB)].

2) Values of sin45 = cos45 = ...

3) If A(1, –3) and B(2, –5) then find d(A,B)

4) In $\triangle ABC$, $AB = 6\sqrt{3}$cm, $AC = 12$cm $BC = 6$cm. Find the measure of $\angle A$.

Q. 2 A) Complete the following activties. (Any Two) 4

1) Eliminate θ from given equations

$x = a\cot\theta - b\,\text{cosec}\,\theta$

$y = a\cot\theta + b\,\text{cosec}\,\theta$

$x = a\cot\theta - b\,\text{cosec}\,\theta$ ---(i)

$y = a\cot\theta + b\,\text{cosec}\,\theta$ ---(ii)

Adding equation (i) and (ii)

$x + y =$ $\square$

$\therefore \quad \cot\theta = \dfrac{x+y}{2a}$

subtracting equation (ii) from (i)

$y - x =$ $\square$

$\therefore \quad \text{cosec}\,\theta = \dfrac{y-x}{2b}$

Now $\square - \square = 1$ (Identity)

$\therefore \quad \left(\dfrac{y-x}{2b}\right)^2 - \square = 1$

$\therefore \quad \dfrac{(y-x)^2}{4b^2} - \dfrac{(y+x)^2}{4a^2} = 1$

or $\left(\dfrac{y-x}{b}\right)^2 - \left(\dfrac{y+x}{a}\right)^2 = 4.$

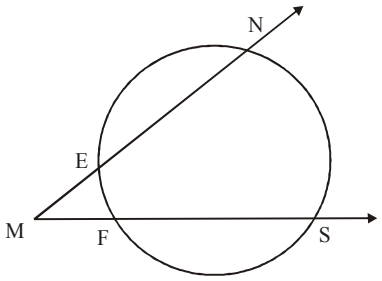
2) In the figure, m(arcNS) = 125°, m(arc EF) = 37°. Find the measure of $\angle NMS$.

$\therefore$ m(arc NS) = $\square$, m(arc EF) = $\square$.

$\angle NMS$ has its vertex in the exterior of the circle and intecepts arc EF and arc NS

$\therefore \quad \angle NMS = \dfrac{1}{2}[\text{m(arc NS)} - \square]$

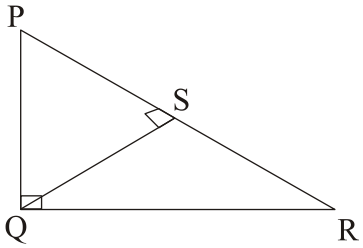
$= \dfrac{1}{2}[125 - 37]$



$$\angle NMS = \frac{1}{2} \times 88$$

$$\therefore \quad \angle NMS = \square$$

3) In a right angled triangle the perpendicular segment to the hypotenuse from the opposite vertex is the geomentric mean of the segments into which the hypotenuse is divided prove the theorem by completing the following activity



Proof : In right angled triangle PQR,

Seg QS $\perp$ hypotenuse PR

$\triangle QSR \sim \triangle PSQ$ (.....)

$$\frac{QS}{\square} = \frac{\square}{SQ}$$

$$\frac{QS}{\square} = \frac{\square}{QS}$$

$$\square = \square \times \square$$

$\therefore$ Seg QS is the geometric mean of seg PS and SR.

Q. 2 B. Solve Any four from the following questions **8**

1) If $\tan\theta + \frac{1}{\tan\theta} = 2$ then prove that

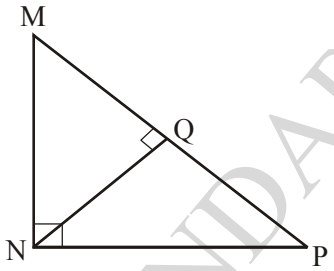
$$\tan^2\theta + \frac{1}{\tan^2\theta} = 2$$

2) If point P(–4, 6) divides the line segment AB with A(–6, 10) and B(r, s) in the ratio 2 : 1, find the co-ordinates of B.

3) Find x if distance between points L(x, 7) and M(1,15) is 10.

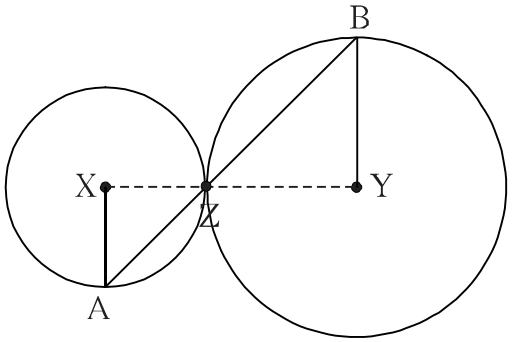
4) Two circles of radii 5.5 cm and 4.2 cm touch each other externally. Find the distance between their ceritres.

5) In figure $\angle MNP = 90°$, seg NQ $\perp$ seg MP, MQ = 9, QP = 4 find NQ.



Q. 3 A. Complete the following activities (Any ONE) **3**

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



Construction : Draw segments XZ and .... .

Proof : By theorem of touching circles, points X, Z, Y are $\square$.

$\therefore \quad \angle XZA \cong \square$ ..... opposite angles

Let $\angle XZA = \angle BZY = a$ ..... (i)

Now, seg $\angle XA \cong$ seg XZ ..... $(\square)$

$\therefore \quad \angle XAZ = \square = a$ ..... (ii) (isosceles triangle theorem)

similarly, seg YB ≅ [ ] ..... ([ ])

∴ ∠BZY = [ ] = a .....(iii) isosedes triangle theorem)

∴ From (i) (ii) and (iii)

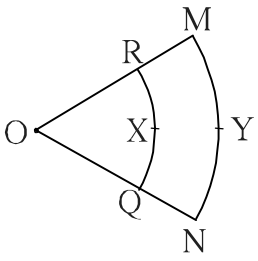
∴ ∠XAZ = ∠YBZ

∴ redius XA || radius YB.

2) A(15, 5), B(9, 20) and A–P–B. Find the ratio in which point P(11, 15) divides segment AB.

Q. 3 B. Solve Any TWO from the following question **6**

1) In figure, O is the centre of the sector. ∠ROQ = ∠MON = 60°. OR = 7 cm, and OM = 21 cm. Find the lengths of arc RXQ and arc MYN. $(\pi = \frac{22}{7})$.



2) Prove that $\sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = \sec\theta - \tan\theta$.

3) Prove that the chords corresponding to congruent arcs of a circle (or congruent circle) are congruent.

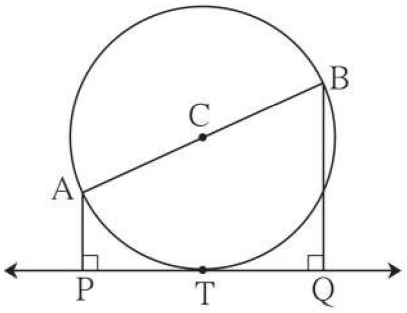
4) Draw a circle with center P and radius 3.4 cm. Take point Q at a distance 5.5 cm from the centre. Construct tangents to the circle from point Q

Q. 4 Solve Any Two from the following quesions **8**

1) Two poles of heights 6 m and 11 m stand vertically on a plane ground. If the distance between their feet is 12 m find the distance between their tips.

2) Find the co-ordinates of the points of trisection of the segment joining the points A (2,–2) and B(–7,4) .

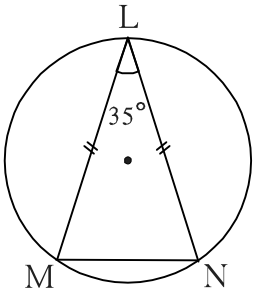
3) In figure seg AB is a diameter of a circle with centre C. Line PQ is a tangent which touches the circle at point T seg AP ⊥ line PQ and seg BQ ⊥ line PQ prove that seg CP ≅ seg CQ.



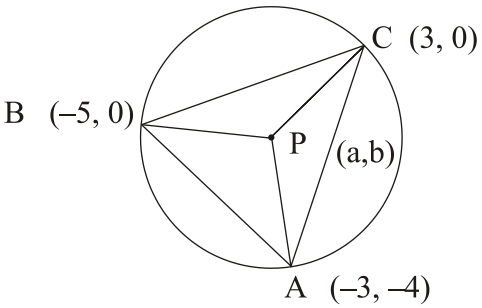
Q. 5 Solve Any ONE from the following question. **3**

1) In fig. Chord LM ≅ chord LN

∠L = 35° find i) m(arc MN) ii) (arc LN).



2) A (–3, –4), B (– 5, 0), C (3, 0) are the vertices of △ABC , find the coordinates of the circumcenter of △ABC



* * *