SCHOLARS ACADEMY

Class Tag Line

Std.: 10 (English) **WWW.SCHOLARSCLASSES.COM/BLOG** **Time: 2 hrs**

Date: 17-01-21 **SUB : MATHEMATICS PART - II** **Marks: 40**

Q.1 A) Solve Multiple choice questions. **(4)**

1) Seg PA and seg PB are the tangents to the circle with centre O. A and B are the points of contacts. If PA = 5cm, what is the length of PB?

a. 10 b. 5 c. 2.5 d. - 10

2) $1 + \cot^2\theta = ?$

a. $\sin^2\theta$ b. $\tan^2\theta$ c. $\sec^2\theta$ d. $\text{cosec}^2\theta$

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

a. Obtuse angled triangle b. Acute angled triangle

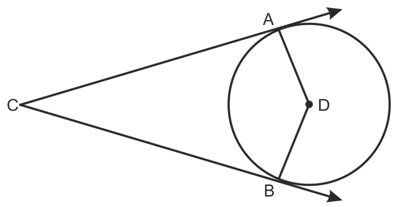
c. Right angled triangle d. Equilateral triangle

4) Distance of point (-3,4) from the origin is ……………

a. 7 b. 1 c. 5 d. -5

B) Solve the following questions. **(4)**

1) In the adjoining figure circle with D touches the side of ∠ ACB at A and B. If ∠ ACB = 52°, find measure of ∠ ADB.



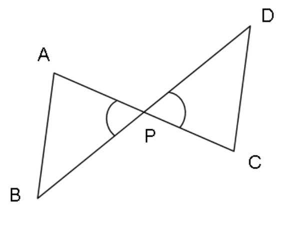
2) Find the distance between each of the following pairs of points.

A (2, 3), B (4, 1)

3) Identify, with reason, if the following is Pythagorean triplet. 4, 9, 12

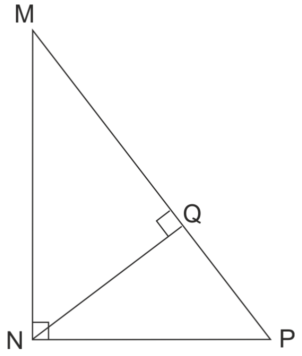
4) In the figure, seg AC and seg BD intersect each other in point P and $\frac{AP}{CP} = \frac{BP}{DP}$.

Prove that, △ABP ~ △CDP



Q.2 A) Complete the following Activities. (Any two) **(4)**

1) In ∠MNP = 90°, seg NQ ⊥ seg MP, MQ = 9, QP = 4, find NQ.



In $\triangle$MNP,

$\angle$MNP = 90° ...(Given)

seg NQ $\perp$ hypotenuse MP ...(Given)

$\therefore$ By property of geometric mean

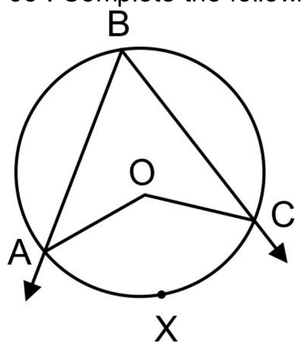
NQ^2 = MQ $\times$ _____

$\therefore$ NQ^2 = _____

$\therefore$ NQ^2 = _____

$\therefore$ NQ = _____ ...(Taking square roots on both the sides)

2) In the following figure,O is the centre of the circle. $\angle$ABC is inscribed in arc ABC and $\angle$ABC = 65°. Complete the following activity to find the measure of $\angle$ AOC.



Activity :

$\angle$ ABC = $\frac{1}{2}$_____ ... [Inscribed angle theorem]

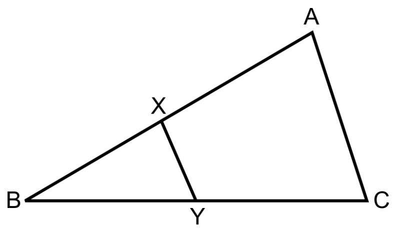
$\therefore$ _____$\times$2 = m (arc AXC)

$\therefore$ m (arc AXC) = _____

$\angle$ AOC = m (arc AXC) ... [Definition of measure of minor arc)

$\therefore$ $\angle$ AOC = _____

3)



In figure XY || seg AC. If 2AX = 3BX and XY = 9. Complete the activity to find the value of AC.

2 AX = 3 BX $\therefore$ $\frac{AX}{BX}$ = _____

$\frac{AX + BX}{BX}$ = _____ ... by componendo

$\frac{AB}{BX}$ = _____ ... (I)

$\triangle$BCA ~ $\triangle$BYX ... _____ test of similarity.

$\therefore$ $\frac{BA}{BX} = \frac{AC}{XY}$ ... corresponding sides of similar triangles.

$\therefore$ $\frac{5}{2} = \frac{AC}{9}$ $\therefore$ AC = _____ ... from (I)

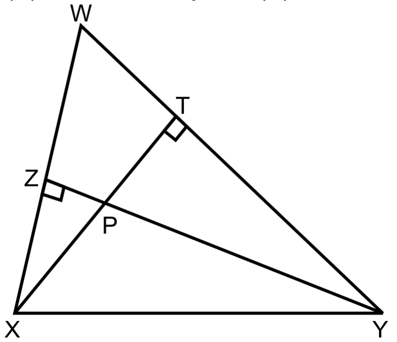
B) Solve the following questions. (Any four) (8)

1) Prove the following

$\frac{\tan^3 \theta - 1}{\tan \theta - 1} = \sec^2\theta + \tan\theta$

2) $\triangle$ABC ~ $\triangle$PQR. A($\triangle$ABC) : A ($\triangle$PQR) = 16 : 25. If BC = 2 cm, find QR.

3) In altitudes YZ and XT of $\triangle$WXY intersect at P. Prove that,
(1) □WZPT is cyclic. (2) Points X, Z, T, Y are concyclic.

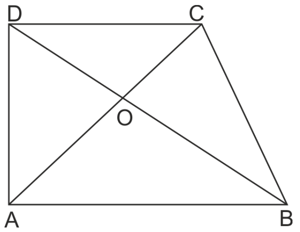


4) Find the length a diagonal of a rectangle having sides 11 cm and 60 cm.

5) Construct a tangent to the circle without using centre of the circle.

Q.3 A) Complete the following activity. (Any one) **(3)**

1)



In the given figure, ABCD is a trapezium in which AB || DC. If 2AB = 3DC, find the ratio of the areas of $\triangle$AOB and $\triangle$COD.

$\frac{AB}{DC} = \frac{3}{2}$

To find : area $\triangle$AOB : area of $\triangle$COD

Proof : In $\triangle$AOB and $\triangle$COD

$\angle$AOB = $\angle$COD ______

$\angle$OAB = ______ (alternate angles)

$\therefore$ $\triangle$AOB ~ $\triangle$COD ______

$\therefore$ $\frac{\text{area } \triangle AOB}{\text{area } \triangle COD}$ = ______ = $\frac{3^2}{2^2}$ = ______

Ratio in the areas of $\triangle$AOB and $\triangle$COD_____

2) If sin θ = $\frac{5}{13}$, where θ is an acute angle, find the value of other trigonometric ratios, using identities.

sin θ = $\frac{5}{13}$ ... (given)

$\sin^2 \theta + \cos^2 \theta$ = 1 ... (Trigonometrically Identity)

$\therefore$ $\cos^2 \theta$ = $1 - \sin^2 \theta$

= ______ ... (given)

$\sin^2 \theta + \cos^2 \theta$ = 1 ...(Trigonometrically Identity)

$\therefore$ $\cos^2 \theta$ = $1 - \sin^2\theta$

= $1 - \frac{25}{169}$

= $\frac{169 - 25}{169}$

= ______

$\therefore$ cos θ = ... (Taking sq. root)

$$\pm\frac{12}{13}$$

$\therefore$ $\cos\theta = \frac{12}{13}$ ... ______

$\tan\theta = \frac{\sin\theta}{\cos\theta}$

$= \frac{\frac{5}{13}}{\frac{12}{13}}$ ... [From (1) and (2)]

$\therefore$ $\tan\theta = \frac{5}{12}$

$\cot\theta = \frac{1}{\tan\theta}$

$= \frac{1}{\left(\frac{5}{12}\right)}$ ... [From (3)]

$\therefore$ $\cot\theta =$ ______

$\sec\theta = \frac{1}{\cos\theta}$

$= \frac{1}{\left(\frac{12}{13}\right)}$ ... [From (2)]

$\therefore$ $\sec\theta =$ ______

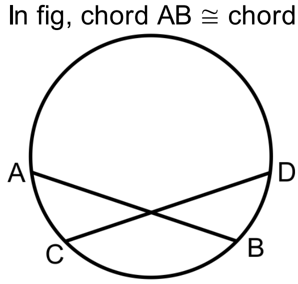
$\text{cosec}\,\theta = \frac{1}{\sin\theta}$

$= \frac{1}{\left(\frac{5}{13}\right)}$ ... [From (1)]

$\therefore$ $\text{cosec}\,\theta =$ ______

B) Solve the following questions. (Any two) **(6)**

1) In fig, chord AB ≅ chord CD, Prove that, arc AC ≅ arc BD.



2) Draw a circle with radius 4.1 cm. Construct tangents to the circle from a point at a distance 7.3 cm from the centre.

3) A triangle ABC with sides AB = 6 cm, BC = 12 cm and AC = 8 cm is enlarged to △PQR such that its largest side is 18 cm. Find the ratio and hence find the lengths of the remaining sides of △PQR.

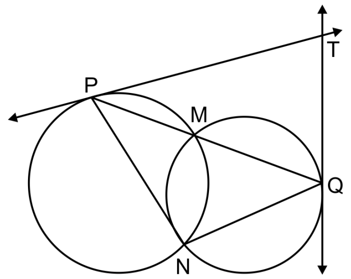
4) Prove the following.

$$\frac{(\cos\theta - \sin\theta)(1 + \tan\theta)}{2\cos^2\theta - 1} = \sec\theta$$

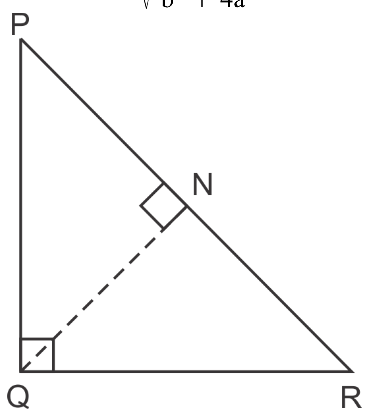
Q.4 Solve the following questions. (Any two) **(8)**

1) △ LTR ~ △ HYD. In △ HYD, where HY = 7.2 cm, YD = 6 cm, ∠Y = 40° and $\frac{LR}{HD} = \frac{5}{6}$ and construct △ LTR & △ HYD.

2) Two circles intersect in points M and N. A secant passing through M intersects the circles in P and Q respectively.
Tangents to the circles at P and Q intersect at T. Prove that □PTQN is a cyclic quadrilateral.



3) △PQR is a right triangle. Right angled at Q such that QR = b and a = A(PQR) = a If QN ⊥ PR then show that QN = $\frac{2ab}{\sqrt{b^4 + 4a^2}}$



Q.5 Solve the following questions. (Any one) (3)

1) △ABC is a triangle where ∠C = 90°.
Let BC = a, CA = b, AB = c and let 'p' be the length of the perpendicular C on AB.
i) With the help of area of triangle, prove cp = ab,
ii)with the application of Pythagoras theorem, prove $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$

2) If tan θ = 2 then find the values of other trigonometric ratios.