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Subject : Math - II **Prelim Question Paper -1** **Total Marks : 40**

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

Q. 1 A. Choose the correct alternatives. 4

1) Out of the following, point ..... lies to the right of the origin on X- axis.

a) (–2, 0) b) (0, 2)

c) (2, 3) d) (2, 0)

2) If two circles are touching externally, how many common tangents of them can be drawn?

a) One b) Two

c) Three d) Four

3) The ratio of circumference and area of a circle is 2 : 7. Find its circumference.

a) 14π b) $\frac{7}{\pi}$

c) 7π d) $\frac{14}{\pi}$

4) Cosec 45^0 x cos 45^0 =

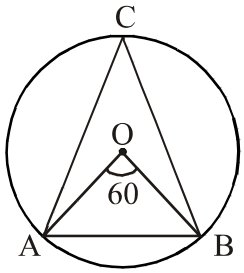
a) 2 b) 1

c) 0 d) ∞

Q. 1 B. Solve the following questions. 4

1) Find the measure of

i) arc AB and ii) arc ACB.



2) Find the volume of cube of length 10 cm.

3) Base of a triangle is 9 and height is 5. Base of another triangle is 10 and height is 6. Find the ratio of areas of these triangles.

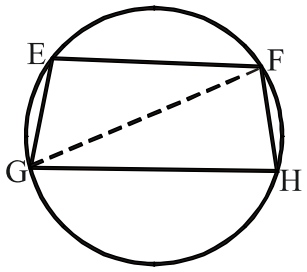
4) Prove that $\frac{\sin^2\theta}{\cos\theta} + \cos\theta = \sec\theta$.

Q. 2 A. Complete the following activities (Any TWO). 4

1) In the figure, chord EF || Chord GH.

Prove that

Chord EG ≅ Chord FH



Fill in the blanks and write the proof.

Proof : Draw seg GF.

∠EFG = ∠FGH = ... (Alternate Angles) ..... (i)

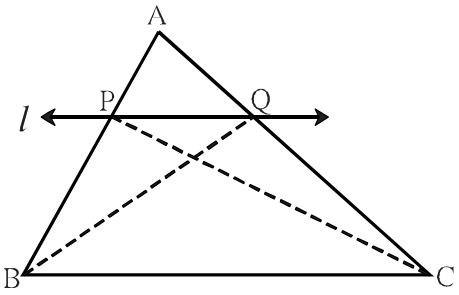
∠ EFG = [ ] .....
(Inscribed angle theorem) ..... (ii)

∠ FGH = [ ] .....
(Inscribed angle theorem) ..... (iii)

m (arc EG) = m ([ ]) ..... [From (1), (2), (3)]

$\therefore$ Chord EG $\cong$ Chord FH ..... (.....)

2) If a line parallel to a side of a triangle intersects the remaining sides in two distinct points, then the line divides the sides in the same proportion. Then prove that $\frac{AP}{PB} = \frac{AQ}{QC}$



Given :

In $\triangle ABC$ line $l \parallel$ line BC

line l intersects AB and AC in points P and Q respectively

To prove $= \frac{AP}{PB} = \frac{AQ}{QC}$

Construction draw seg PC and seg BQ

Proof - $\triangle APQ$ and $\triangle PQB$ have equal heights

$\therefore \frac{A(\triangle APQ)}{A(\triangle PQB)} = \frac{AP}{\square}$ ---(i)

(areas proportionate to bases)

Similary

$\frac{A(\triangle APQ)}{\square} = \frac{AQ}{QC}$ ---(ii)

(areas proportionate to bases)

seg PQ is common base of $\triangle PQB$ and $\triangle PQC$ seg PQ $\parallel$ seg BC hence $\triangle PQB$ and $\triangle PQC$ have equal heights.

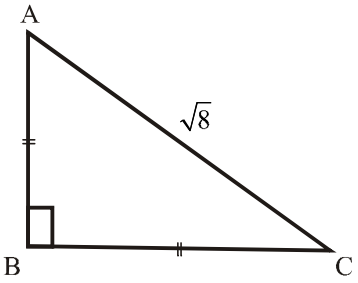
$\triangle PQB = \square$ ---(iii)

$\frac{A(\triangle APQ)}{A(\triangle PQB)} = \frac{A(\triangle APQ)}{\square}$ --- from (i), (ii) and (iii)

$\therefore \frac{AP}{PB} = \frac{AQ}{QC}$

3) To find AB and BC with the help of information given in figure complete the following activity

AB = BC ..... (Side opposite to congruent angle)



$\angle BAC = 45^0$

$\therefore AB = BC = \square \times AC$

$= \square \times \sqrt{8}$

$= \square \times 2\sqrt{2}$

$= \square$

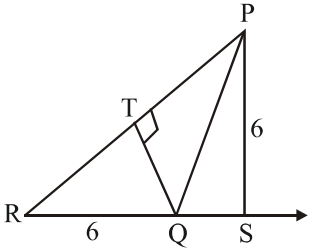
B. Solve any Four of the following questions : **(8)**

1) Draw any circle. Take any point A on it and construct tangents at A without using the centre of the circle.

2) Find the distance between the points P(–6, –3), Q (–1, 9).

3) If $\cot\theta = \frac{40}{9}$ find the value of $\operatorname{cosec}\theta$ and $\sin\theta$.

4) In following figure, Seg RQ, Seg QT $\perp$ seg PR. If RQ = 6, PS = 6 and PR = 12, Then find QT.

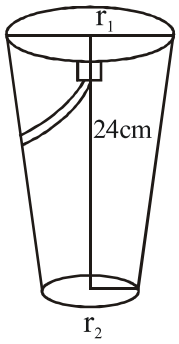


5) Prove that, any rectangle is a cyclic quadrilateral.

Q. 3 A. Complete the following activities

(Any ONE). **(3)**

1) The circumferences of circular faces of a frustum are 132 cm and 88 cm and its height is 24 cm. To find the curved surface area of the frustum complete the following activity.



$\left(\pi = \frac{22}{7}\right)$

$\text{circumference}_1 = 2\pi r_1 = 132$

$r_1 = \frac{132}{2\pi} = \square$

$\text{Circumference}_2 = 2\pi r_2 = 88$

$r_2 = \frac{88}{2\pi} = \square$

Slant height of frustum,

$l = \sqrt{h^2 + (r_1 - r_2)^2}$

$= \sqrt{\square^2 + \square^2}$

$= \square$ cm

Curved surface area of the frustum $= \pi (r_1 + r_2) l$

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

$= \square$ sq. cm.

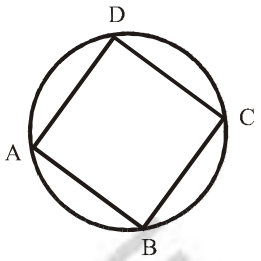
2) Opposite angles of a cyclic quadrilateral are supplementary. To prove it complete the following activity.

Given : $\square$ is cyclic

To prove :

$\angle B + \angle D = \square$

$\square + \angle C = 180^0$



Proof : Arc ABC is intercepted by the inscribed angle $\angle ADC$

$\therefore \angle ADC = \frac{1}{2} \square$ ..... (I)

similarly $\square$ is an incribed angle

It intercepts arc ADC

$\therefore \square = \frac{1}{2}$ m(are ADC) .....(II)

$\therefore m\angle ADC + \square = \frac{1}{2} \square +$

$\frac{1}{2}$ m(arc ADC) from (I) & (II)

$= \frac{1}{2} [\square + m(\text{arc ADC})]$

$= \frac{1}{2} \times 360^0$ ..... arc ABC and arc ADC constitute a complete circle

$= \square$

similarly we can prove $\angle A + \angle C$

$= \square$

Q. 3 B) Solve the following questions :

(Any TWO) **6**

1) Find the type of the quadrilateral, if point A(-4, -2), B (-3,-7), C (3,-2) and D (2,3) are joined serially.

2) An observer at a distance of 10 m from a tree looks at the top of the tree the angle of elevation is 60^0 what is the height of the tree ? $\left(\sqrt{3} = 1.73\right)$

3) $\triangle AMT \sim \triangle AHE$. In $\triangle AMT$,

$AM = 6.3\,cm$

$\angle TAM = 50^0$, $AT = 5.6\,cm$ $\frac{AM}{AH} = \frac{7}{5}$

construct $\triangle AHE$

4) Prove that in a right angled triangle the square of the hyotenuse is equal to the sum of th squares of remaining two sides.

Q. 4 Solve the following questions :

(Any TWO) **8**

1) Prove that the points P(0, – 4), Q (6, 2) R (3, 5) and S (–3, –1) are the vertices of a rectangle.

2) The dimensions of a solid metalic cuboid are 72 cm × 30 cm × 75 cm. It is melted and recast into identical solid metal cubes with each of edge 6 cm. Find the number of cubes formed. Also find the cost of polishing the surfaces of all the cubes formed at the rate Rs. 150 per sq. m.

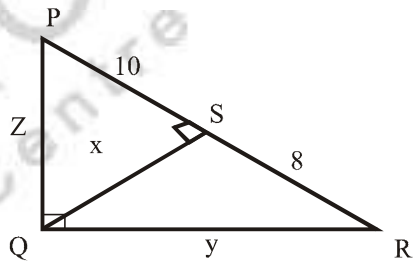
3) A tent of a circus is such that its lower part is cylindrical and upper part is conical. The diameter of the base of the tent is 48 m and the height of the cylindrical part is 15 m. Total height of the tent is 33 m. Find area of canvas required to make the tent. Also find volume of air in the tent.

Q. 5 Solve any ONE of the following quetions :

(Any ONE). **3**

1) If $5\sin\theta - 12\cos\theta = 0$ find the value of $\sec\theta$ and $\operatorname{cosec}\theta$

2) In $PQR, \angle PQR = 90^0$ seg $QS \perp$ seg PR then find x, y, z.



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