

MT

2018 ____ 1100

Seat No.

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MT - GEOMETRY - SEMI PRELIM - I : PAPER - 6

Time : 2 Hours

(Pages 5)

Max. Marks : 40

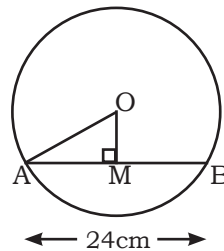
Q.1. (A) Solve the following : (Any 4) 4

1. If adjacent sides of a parallelogram are 3 cm and 4 cm, then find the perimeter of the parallelogram.
2. Radius of a circle is 8 cm. Find the length of the longest chord of the circle.
3. Side of a square is 5 cm. What is the length of its diagonal.
4. In a rhombus ABCD, if $\angle DAC = 35^\circ$, then $\angle ABC = ?$
5. Write the equation of x-axis.
6. Write the equation of a line passing through 4 on the x-axis and parallel to y-axis.

Q.1. (B) Solve the following : (Any 2) 4

1. In parallelogram WXYZ, $\angle XYZ = 135^\circ$, then what is the measure of $\angle XWZ$ and $\angle YZW$?

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.



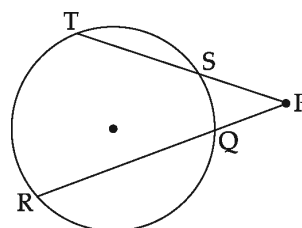
3. The adjacent sides of a rectangle are 7 cm and 24 cm. Find the length of its diagonal.

Q.2. (A) Solve the following MCQs :**4**

- 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
- 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
- Distance of point $(-3, 4)$ from the origin is _____.
(A) 7 (B) 1 (C) 5 (D) -5
- In a right angled triangle, if sum of the squares of the sides making right angle is 169 then what is the length of the hypotenuse?
(A) 15 (B) 13 (C) 5 (D) 12

Q.2. (B) Solve the following : (Any 2)**4**

- In ΔPQR , $PQ = \sqrt{8}$, $QR = \sqrt{5}$, $PR = \sqrt{3}$. Is ΔPQR a right angled triangle? If yes, which angle is 90° ?
- In the adjoining figure,
if $PQ = 6$, $QR = 10$,
 $PS = 8$, find TS .

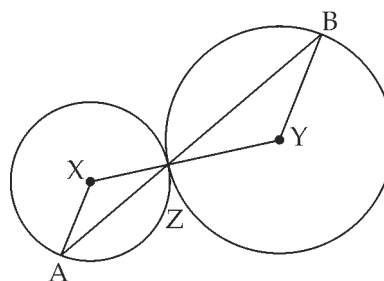


- Find the centroid of a triangle whose vertices are $(-7, 6)$, $(2, -2)$ and $(8, 5)$

Q.3. (A) Solve the following activity : (Any 2)**4**

- In the adjoining fig., 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.

Construction :

Draw segments XZ and 

Proof :

By theorem of touching circles, points X, Z, Y are

$$\angle XZA \cong \text{ } \quad \dots(\text{Vertically Opposite angles})$$

$$\text{Let } \angle XZA = \angle BZY = a \quad \dots(\text{i})$$

$$\text{seg } XA \cong \text{seg } XZ \quad \text{ }$$

$$\therefore \angle XAZ = \text{ } = a \quad \dots(\text{ii}) \text{ (Isosceles triangle theorem)}$$

$$\text{seg } YB \cong \text{ } \quad \text{ }$$

$$\therefore \angle BZY = \text{ } = a \quad \dots(\text{iii}) \text{ (Isosceles triangle theorem)}$$

$$m\angle XAZ = m\angle YBZ = a \quad \dots[\text{From (i), (ii) and (iii)}]$$

$$\therefore \text{Radius } XA \parallel \text{radius } YB \quad \text{ }$$

2. Similarity in Right Angled Triangles :

'In a right angled triangle, if the altitude is drawn from the vertex of the right angle to the hypotenuse, then the two triangles formed are similar to the original triangle and to each other'.

Given :

(1) In $\triangle ABC$, $\angle ABC = 90^\circ$

(2) $\text{seg } BD \perp \text{hypotenuse } AC$, A - D - C

To Prove :

$$\triangle ABC \sim \triangle ADB \sim \triangle BDC$$

Proof :

In $\triangle ABC$ and $\triangle ADB$,

$$\angle ABC \cong \angle ADB \quad \text{ }$$

$$\angle A \cong \angle A \quad \text{ }$$

$$\therefore \text{ } \sim \text{ } \quad \dots(\text{i}) \text{ (By AA Test of similarity)}$$

In $\triangle ABC$ and $\triangle BDC$,

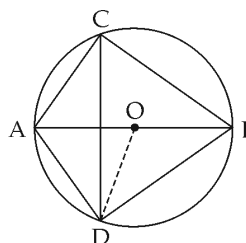
$$\text{ } \cong \text{ } \quad \dots(\text{Each is a right angle})$$

$$\text{ } \cong \text{ } \quad \dots(\text{Common angle})$$

$$\therefore \triangle ABC \sim \triangle BDC \quad \dots(\text{ii}) \text{ }$$

$$\therefore \triangle ABC \sim \text{ } \sim \text{ } \quad \dots[\text{From (i) and (ii)}]$$

3. 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 that: seg AD \cong seg BD
 Proof : Draw seg OD.



$\angle ACB = \square$ (\because Angle inscribed in a semicircle)
 $\angle DCB = \square$ (\because CD bisects $\angle ACB$)
 $m(\text{arc DB}) = \square$...(Inscribed angle theorem)
 $\angle DOB = \square$...(i) (Definition of measure of an arc)
 seg OA \cong seg OB ... (ii)
 seg OD is of seg AB [From (i) and (ii)]
 \therefore seg AD \cong seg BD

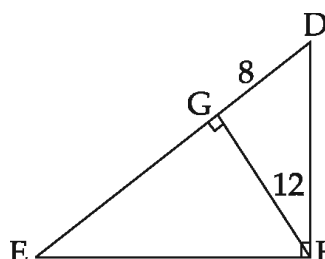
Q.3. (B) Solve the following : (Any 2) 4

1. If slope of the line joining points P(k, 0) and Q(-3, -2) is $\frac{2}{7}$, then find k.
2. Seg AM is a median of $\triangle ABC$. If AB = 22, AC = 34, BC = 24, then find AM.
3. Prove that, any rectangle is a cyclic quadrilateral.

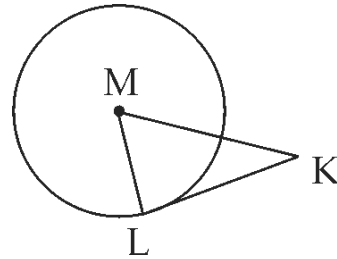
Q.4. Solve the following : (Any 3) 9

1. Determine whether R(1, -4), S(-2, 2) and T(-3, 4) are collinear.
2. Find the co-ordinates of the points of trisection of the line segment AB with A(2, 7) and B(-4, -8).

3. In the adjoining figure, $\angle DFE = 90^\circ$, $FG \perp ED$,
 If GD = 8, FG = 12,
 find (i) EG (ii) FD
 and (iii) EF.



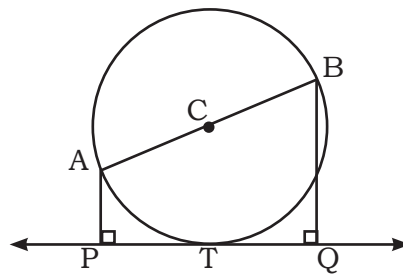
4. In the adjoining figure, M is the centre of the circle and seg KL is a tangent segment. If $MK = 12$, $KL = 6\sqrt{3}$, then find
- Radius of the circle.
 - Measure of $\angle K$ and $\angle M$.



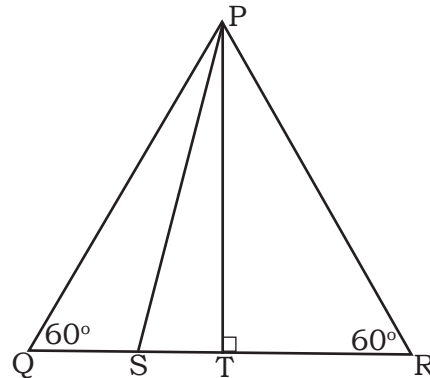
Q.5 Solve the following : (Any 1)

4

1. In the adjoining figure, seg AB is a diameter of a circle with centre C. Line PQ is a tangent, it touches the circle at T. Segments AP and BQ are perpendiculars to line PQ. Prove seg CP \cong seg CQ.



2. In the adjoining figure, ΔPQR is an equilateral triangle. Point S is on seg QR such that $QS = \frac{1}{3} QR$. Prove that $9 PS^2 = 7 PQ^2$



Q.6 Solve the following : (Any 1)

3

- Find the co-ordinates of the points of trisection of the line segment AB with $A(2, 7)$ and $B(-4, -8)$.
- Pranali and Prasad started walking to the East and to the North respectively, from the same point and at the same speed. After 2 hours distance between them was $15\sqrt{2}$ km. Find their speed per hour.

Best Of Luck 🍀