

FIRST TERM EXAM - 2023-2024

STD: X
SUB: GEOMETRY

TIME: 2 HR
MARKS: 50

I A **Choose the correct alternative and write its alphabet:** **(4 marks)**

- 1) If $\Delta ABC \sim \Delta DEF$ and $\angle A = 48^\circ$, then $\angle D = \dots\dots\dots$
A) 48° B) 49° C) 83° D) 132°

- 2) Seg AB is Parallel to x-axis and co-ordinates of point A are (1, 3) then the co-ordinates of point B can be
- A) (-3, 1) B) (-5, 3) C) (3, 0) D) (5, 1)

- 3) The total surface area of a hemisphere is $300\pi \text{ cm}^2$ then find its radius.
A) 8cm B) 9cm C) 10cm D) 12cm

- 4) Apollonius theorem is associated with _____ of a triangle.
A) Angle bisector B) Altitude C) Median D) None of these.

I B **Solve the following Sub-questions.** **(4 marks)**

- 1) Find the side of a square whose diagonal is $12\sqrt{2}$ cm.

- 2) The ratio of corresponding sides of similar triangle is 3 : 5 , then find the ratio of their areas.

- 3) The three sides of ΔLMN are 13, 12, 5 determine whether ΔLMN is a right-angled triangle or not.

- 4) If P is the midpoint of line segment AB with A (-4, 2) and B (6, 2) then find y co-ordinate of P.

II A **Complete the following activities and rewrite it :(Any 2)** **(4 mk)**

- 1) To find the distance between the points P(6, -6) and Q (3, -7) complete the following activity

Activity :

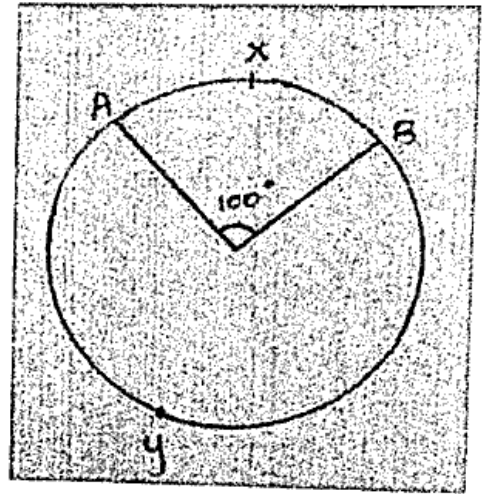
Let $P(6, -6) \equiv (x_1, y_1)$, $Q(3, -7) \equiv (x_2, y_2)$
 By distance formula,

$$d(P, Q) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(3 - 6)^2 + (-7 - \square)^2}$$

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

$$\therefore d(P, Q) = \square$$



- 2) Complete the following table with help of adjoining figure. O is the centre of the circle and $m\angle AOB = 100^\circ$

Type of arc	Name of the arc	Measure of the arc
.....	arc AXB	
.....	arc AYB	

- 3) With the help of the information given in the figure, fill in the boxes to find BC.

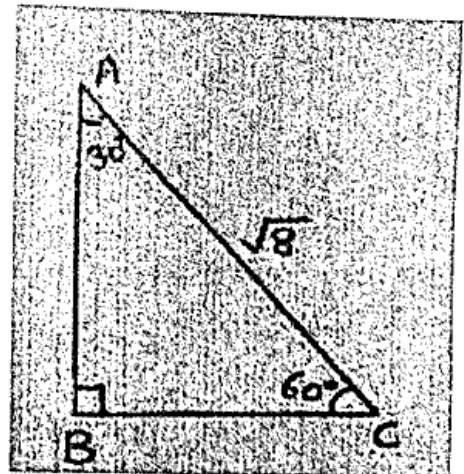
ΔABC is $30^\circ - 60^\circ - 90^\circ$ triangle

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

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

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

$$\therefore BC = \square$$

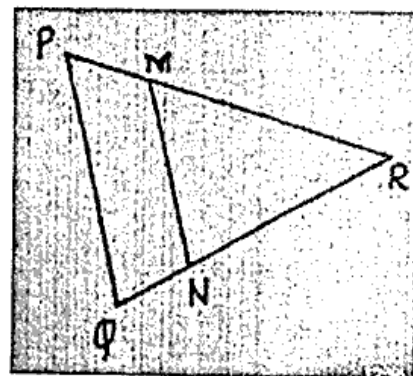


II B Solve the following Sub-questions : (Any 4)

(8 marks)

- 1) If A (- 7, 6) , B (2 , - 2) and C (8 , 5) are the co-ordinates of vertices of a triangle then find the co-ordinates of centroid.
- 2) Find the volume of a sphere of diameter 6 cm.
- 3) Draw a circle of radius 3 cm. Take any point P on it . Draw tangent to the circle through Point P without using the centre of the circle.
- 4) In ΔPQR , Seg PM is a median . If $PM = 9$ and $PQ^2 + PR^2 = 290$ then find QR.

- 5) In the give figure, $PM = 14$, $PR = 35$, $QN = 10$ and $QR = 25$ then is Seg MN parallel to side PQ ? Give reason.



III A Complete the following activity and rewrite it. (Any 1) (3 marks)

- 1) Complete the following activity to find the capacity of the bucket. A bucket is frustum shaped. Its height is 28cm . Radii of circular faces are 12 cm and 15 cm.

Solution :

$$r_1 = 15 \text{ cm} , \quad r_2 = 12 \text{ cm} , \quad h = 28 \text{ cm}.$$

$$\text{capacity of bucket} = \text{volume of frustum.}$$

$$= \boxed{} \dots\dots \text{(formula)}$$

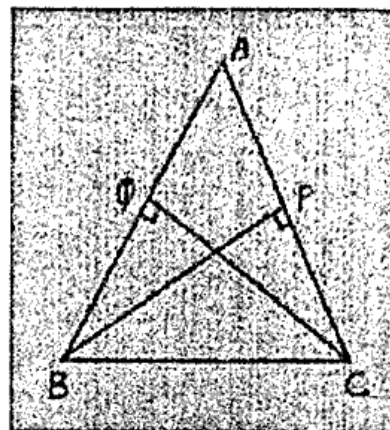
$$= \frac{1}{3} \times \frac{22}{7} \times 28 \times (\square^2 + \square^2 + \square \times \square)$$

$$= \frac{22 \times 4}{3} \times (\square + \square + \square)$$

$$= 16404 \text{ cm}^3$$

$$= \boxed{} \text{ liter.}$$

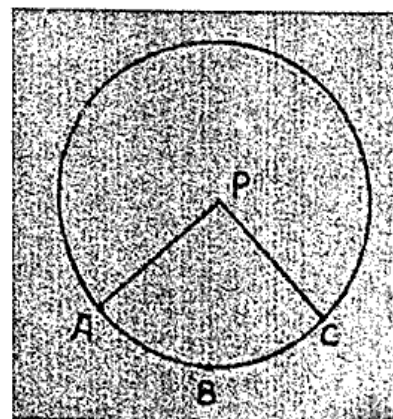
- 2) In the adjoining figure, $BP \perp AC$, $CQ \perp AB$,
 $A - P - C$, $A - Q - B$.
 Prove that $\angle PBA \cong \angle QCA$
 Complete the following Proof.



In $\triangle APB$ and $\triangle \text{-----}$
 $\angle \text{-----} \cong \angle \text{-----}$ (common angle)
 $\angle \text{-----} \cong \angle \text{-----}$ (Each 90°)
 $\therefore \triangle \text{-----} \sim \triangle \text{-----}$ (A A Test)
 $\therefore \angle PBA \cong \angle QCA \dots \dots \dots$ (... ..)

III B Solve the following Sub-questions : (Any 2) (6 marks)

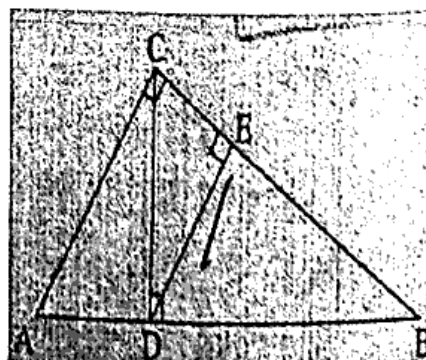
- 1) Draw a circle with centre P. Draw an arc AB of measure 90° . Draw tangents to the circle at point A & Point B. Let these tangents intersect each other at Point C. Write the type of \square PACB formed.
- 2) Radius of circle is 3.5 cm and Perimeter of Sector (P - ABC) is $\frac{32}{3}$. Find \angle (P - ABC)
- 3) Given A (4, - 3), B (8, 5). Find the coordinates of the point that divides seg AB in the ratio 3:1
- 4) Prove that "The ratio of areas of two similar triangle is equal to the square of the ratio of their corresponding sides."



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IV Solve the following Sub-questions. (Any 2) (8 marks)

- 1) In $\triangle ABC$, $\angle ACB = 90^\circ$
 Seg $CD \perp$ Seg AB and Seg $DE \perp$ Seg CB
 Prove that $CD^2 \times AC = AD \times AB \times DE$
- 2) $\triangle ABC \sim \triangle LBN$ In $\triangle ABC$, $AB = 5.1$ cm,
 $\angle B = 40^\circ$, $BC = 4.8$ cm $\frac{AC}{LN} = \frac{4}{7}$. Construct
 $\triangle ABC$ and $\triangle LBN$.

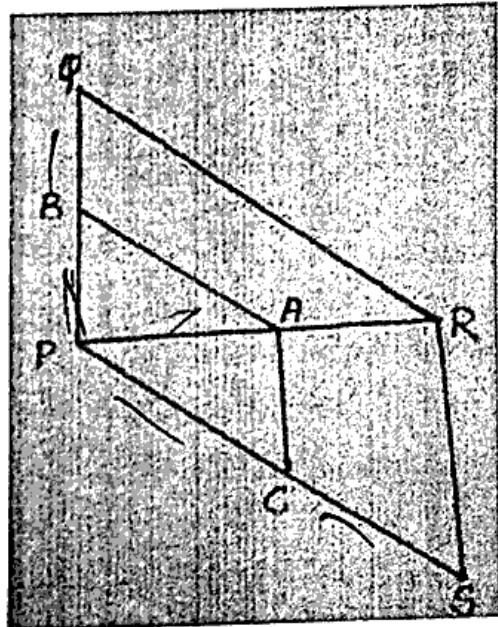


- 3) Water drops from a tap at the rate of 4 drops in every 3 seconds. Volume of one drop is 0.4cm^3 . If the dripped water is collected in a cylindrical vessel of height 7 cm and diameter 8 cm, in what time will the vessel be completely filled? What is the volume of water collected? How many times will the Vessel be completely filled in 3 hours and 40 minutes?

V. Solve the following Sub-questions (Any 1) (3 marks)

- 1) The points $(K, 3)$, $(2, -4)$ and $(-K + 1, -2)$ are collinear. Find K.

- 2) In the given figure, If $\text{seg } AB \parallel \text{side } RQ$ and $\text{Seg } AC \parallel \text{side } RS$ then prove that $\frac{PB}{PQ} = \frac{PC}{PS}$



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