

N 932

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2026 III 09 1100 – N 932– MATHEMATICS (71) GEOMETRY—PART II (E)

(REVISED COURSE)

Time : 2 Hours

(Pages 11)

Max. Marks : 40

Note :—

- (i) All questions are compulsory.
- (ii) Use of a calculator is not allowed.
- (iii) The numbers to the right of the questions indicate full marks.
- (iv) In case of MCQs [Q. No. 1(A)] only the first attempt will be evaluated and will be given credit.
- (v) Draw proper figures wherever necessary.
- (vi) The marks of construction should be clear. Do not erase them.
- (vii) Diagram is essential for writing the proof of the theorem.

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1. (A) For each of the following sub-question four alternative answers are given. Choose the correct alternative and write its alphabet. 4

(1) 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)

(2) Two circles having radii 4 cm and 5 cm touch each other internally. Then the distance between the centres is

(A) 4 cm

(B) 5 cm

✓ (C) 1 cm

(D) 9 cm

(3) Out of the following points lies to the right of the origin on X-axis.

(A) (-2, 0)

(B) (0, 2)

(C) (2, 3)

✓ (D) (2, 0)

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- (4) If the side of the cube is 5 cm, then the volume of that cube is

- (A) 10 cm^3
(B) 100 cm^3
✓ (C) 125 cm^3
(D) 25 cm^3

(B) Solve the following sub-questions :

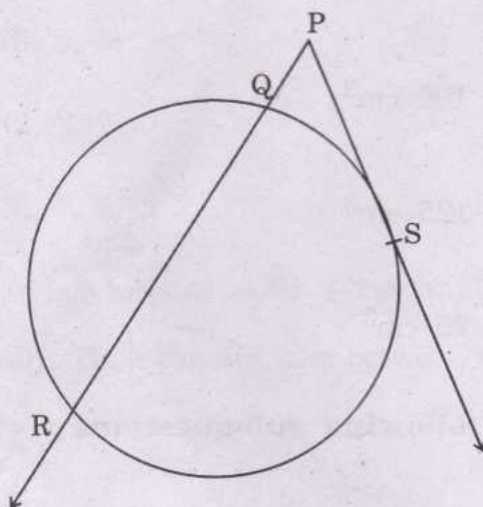
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- ✓ (1) The ratio of corresponding sides of similar triangles is 3 : 5, then find the ratio of their areas.
- ✓ (2) Find the side of a square if its diagonal is $10\sqrt{2}$ cm.
- ✓ (3) If the measure of minor arc is 70° , then find the measure of corresponding major arc.
- ✓ (4) Angle made by the line with the positive direction of X-axis is 45° , find the slope of line.

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2. (A) Complete the following activities and rewrite it (any two) : $\frac{4}{4}$

- (1) In the following figure, seg PS is a tangent segment, line PR is a secant. If $PQ = 3.6$, $QR = 6.4$, find PS.



Activity :

$$PS^2 = \boxed{PQ} \times PR \text{ (Tangent secant segment theorem)}$$

$$= PQ \times [PQ + QR]$$

$$= \boxed{3.6} \times [3.6 + 6.4]$$

$$= 3.6 \times \boxed{10}$$

$$\therefore PS^2 = 36$$

$$PS = \boxed{6}$$

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- (2) If $\sec \theta = \frac{25}{7}$, find the value of $\tan \theta$.

Solution :

$$1 + \tan^2 \theta = \boxed{\sec^2 \theta}$$

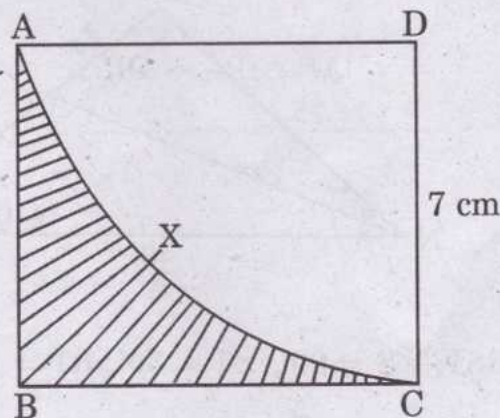
$$\therefore 1 + \tan^2 \theta = \boxed{\frac{25}{7}}^2$$

$$\begin{aligned}\therefore \tan^2 \theta &= \frac{625}{49} - \boxed{1} \\ &= \frac{625 - 49}{49}\end{aligned}$$

$$\therefore \tan^2 \theta = \frac{576}{49}$$

$$\therefore \tan \theta = \boxed{\frac{24}{7}}$$

- (3) In the following figure, side of square ABCD is 7 cm. With centre D and radius DA, sector D-AXC is drawn. Fill in the following boxes properly and find out the area of shaded region :



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Solution :

$$\text{Area of square} = (\text{side})^2$$

$$= (7)^2$$

$$\therefore \text{Area of square} = \boxed{} \text{ cm}^2$$

If area of sector (D-AXC) = 38.5 cm^2 , then

$$A (\text{shaded region}) = A \boxed{} - A \boxed{}$$

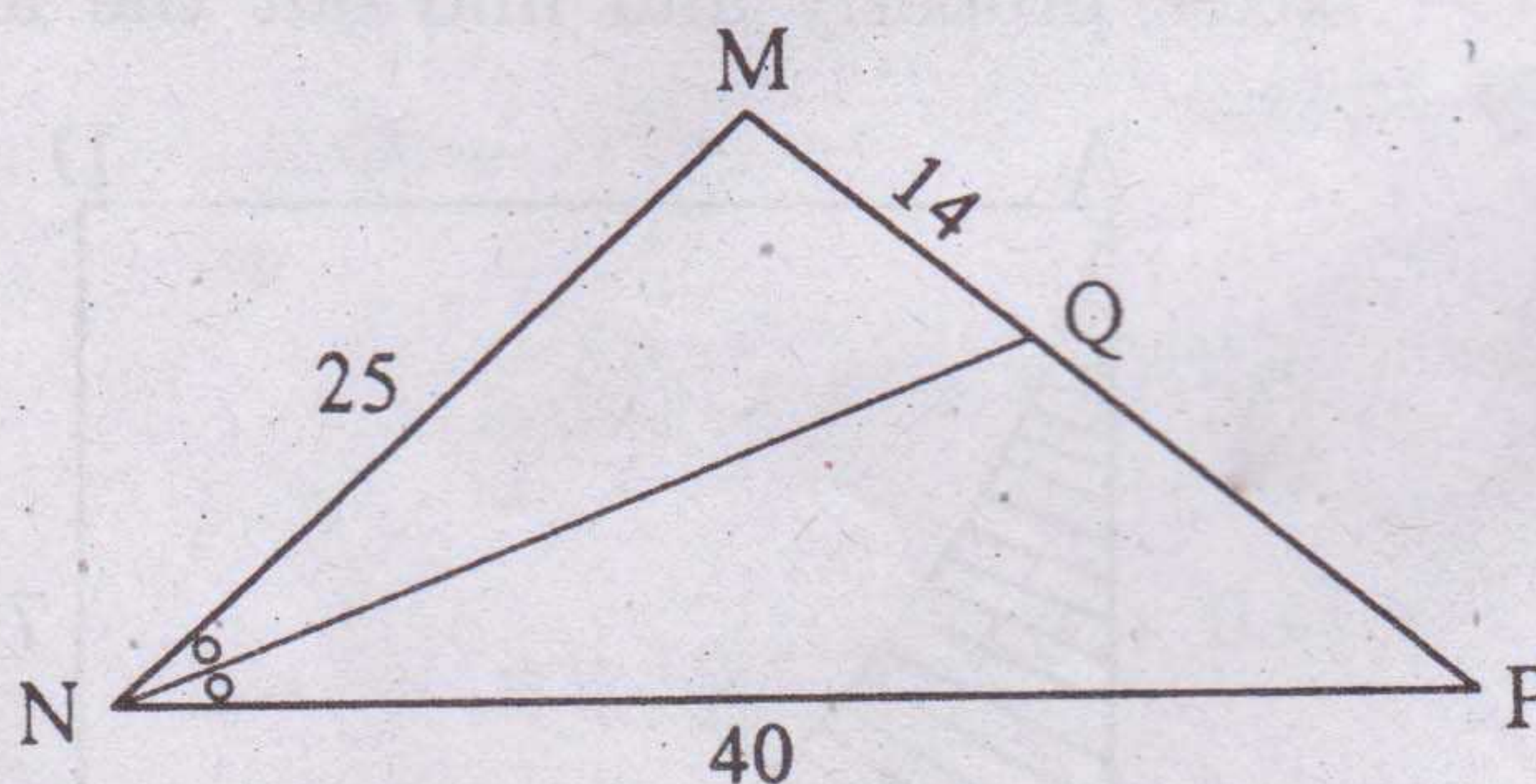
$$= 49 \text{ cm}^2 - 38.5 \text{ cm}^2$$

$$= \boxed{} \text{ cm}^2$$

(B) Solve the following sub-questions (any four) :

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(1) Find QP using given information in the figure :



(2) In $\triangle RST$, $\angle S = 90^\circ$, $\angle T = 30^\circ$, $RT = 12 \text{ cm}$, then find RS and ST.

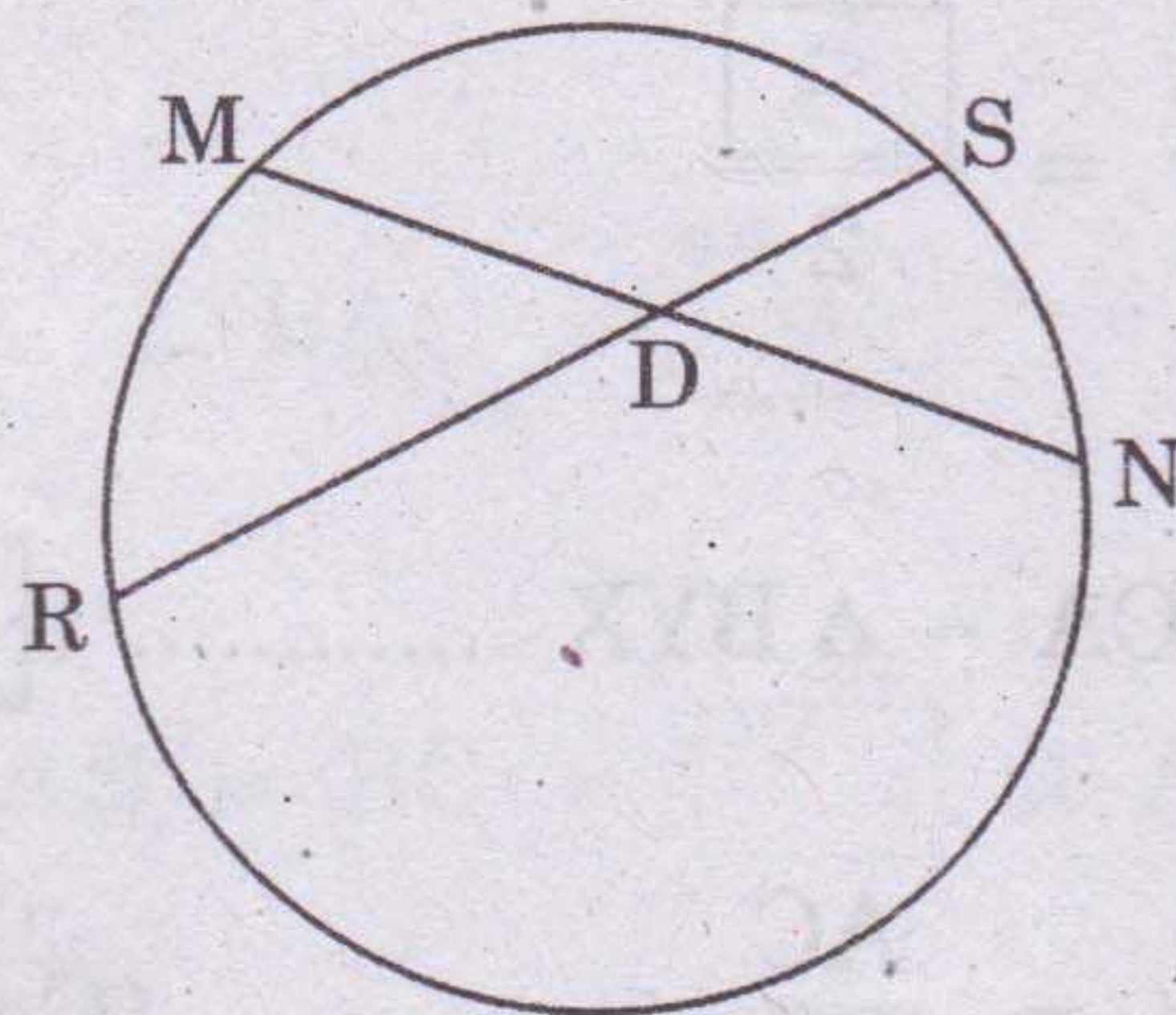
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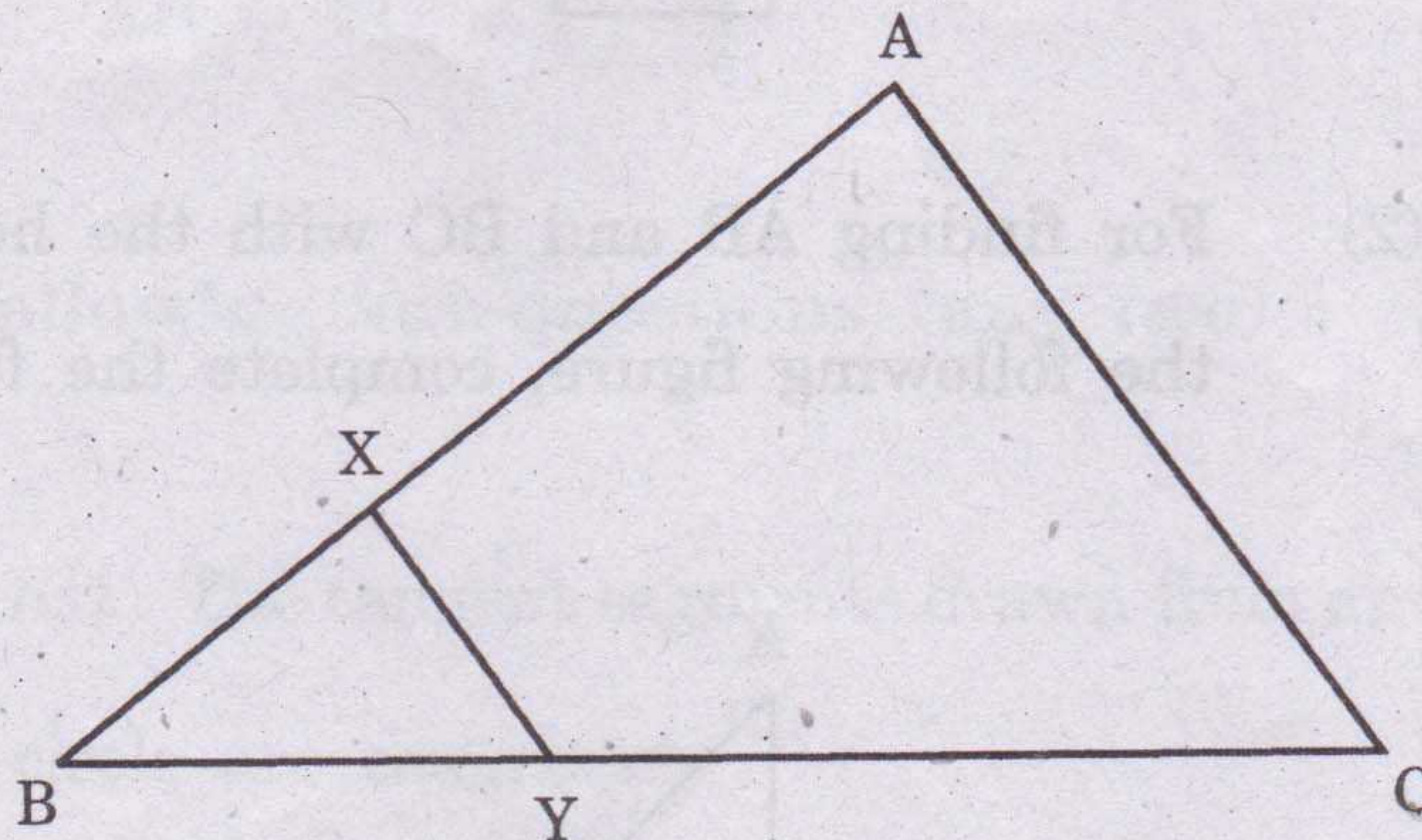
- (3) In the following figure, chord MN and chord RS intersect at point D. If $RD = 15$, $DS = 4$, $MD = 8$, find DN.



- (4) Find the co-ordinates of the midpoint of the line segment joining points $P(0, 6)$ and $Q(12, 20)$
- (5) Prove that : $\sin^2 \theta + \cos^2 \theta = 1$.

3. (A) Complete the following activities and rewrite it (any one) : 3

- (1) In the following figure, seg $XY \parallel$ side AC. If $2AX = 3BX$ and $XY = 9$, complete the activity to find the value of AC.



Activity :

$$2AX = 3BX$$

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

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$$\therefore \frac{AX + BX}{BX} = \frac{\boxed{} + \boxed{}}{2} \dots\dots\dots (\text{By componendo})$$

$$\frac{AB}{BX} = \frac{\boxed{}}{2}$$

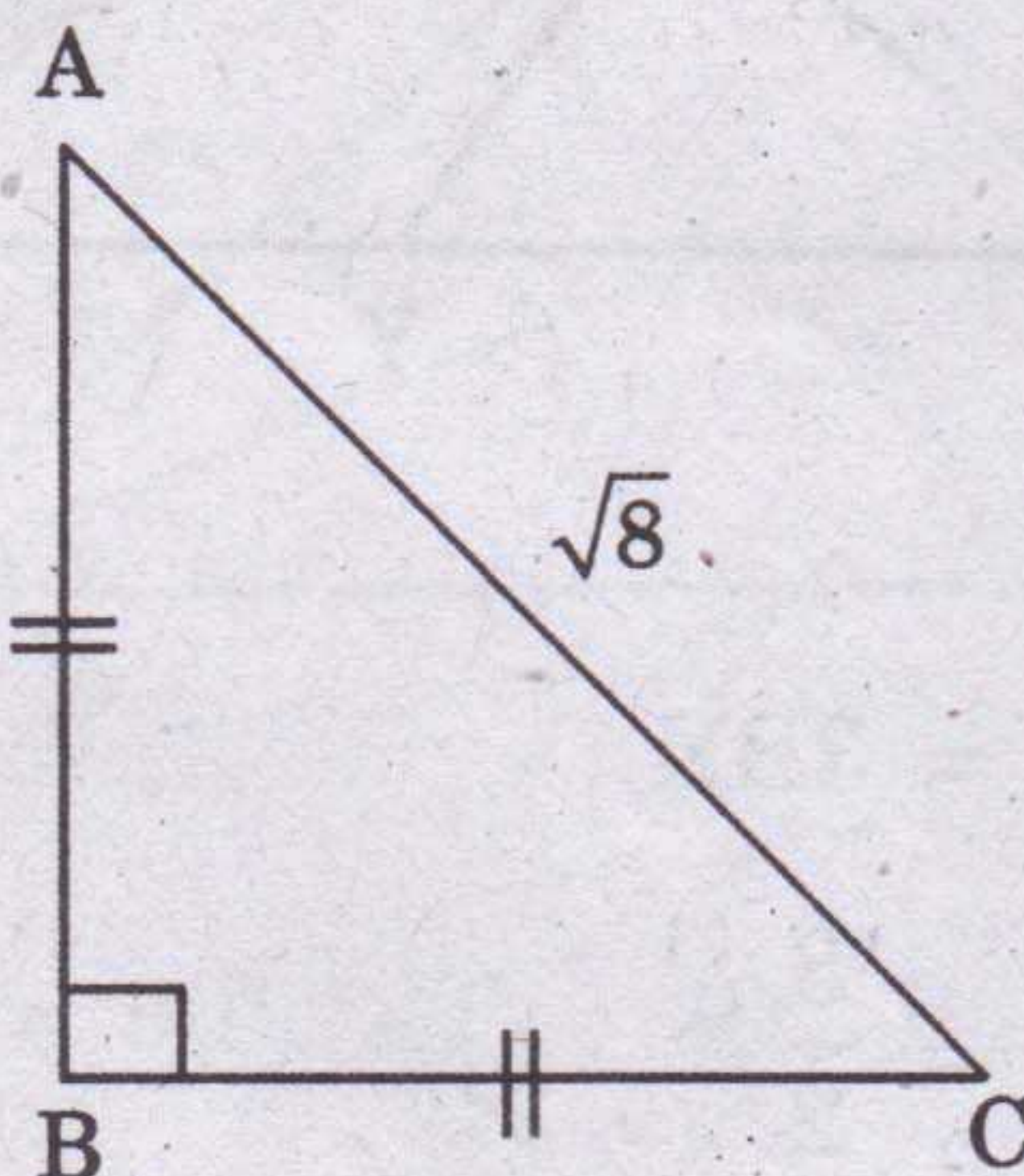
$$\triangle BCA \sim \triangle BYX \dots\dots\dots (\boxed{} \text{ Test of similarity})$$

$$\therefore \frac{BA}{BX} = \frac{AC}{XY} \dots\dots\dots (\text{Corresponding sides of similar triangles})$$

$$\therefore \frac{5}{\boxed{}} = \frac{AC}{9}$$

$$\therefore AC = \boxed{}$$

(2) For finding AB and BC with the help of information given in the following figure, complete the following activity :



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Activity :

$$AB = BC \dots\dots\dots \boxed{}$$

$$\therefore \angle BAC = \boxed{}$$

$$\therefore AB = BC = \boxed{} \times AC$$

$$= \frac{1}{\sqrt{2}} \times \boxed{}$$

$$= \frac{1}{\sqrt{2}} \times 2 \times \boxed{}$$

$$AB = BC = \boxed{}$$

(B) Solve the following sub-questions (any two) :

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- (1) Prove that : The tangent segments drawn from an external point to the circle are congruent.
- (2) Draw a circle with centre O and radius 3.5 cm, take a point P at a distance 5.7 cm from the centre. Draw tangents to the circle from point P.

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(3) Find the co-ordinates of point P, if P divides the line segment joining the points A(-1, 7) and B(4, -3) in the ratio 2 : 3.

(4) A bucket is frustum shaped. Its height is 28 cm. Radii of circular faces are 12 cm and 15 cm. Find the capacity of the bucket in litres.

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

4. Solve the following sub-questions (any two) :

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(1) $\triangle ABC \sim \triangle ADE$,

In $\triangle ABC$, $AB = 6.3$ cm, $\angle CAB = 50^\circ$, $AC = 5.6$ cm and $\frac{AB}{AD} = \frac{7}{5}$.

Construct $\triangle ADE$.

(2) Surface area of sphere and total surface area of cube are same. Show that the ratio of the volume of the sphere to that of the cube is $\sqrt{6} : \sqrt{\pi}$.

(3) In $\triangle ABC$, A-X-B and A-Y-C is such that segment XY $\parallel$ side BC. Segment XY divides $\triangle ABC$ in two equal areas, then find $\frac{BX}{AB}$.

5. Solve the following sub-questions (any one) :

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(1) Seg PQ is a chord of a circle. Arc PXQ is a major arc and Arc PYQ is a minor arc. $\angle POQ$ is central angle of the circle :

(a) Draw the figure from given information.

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- (b) Find the measure of $\angle PXQ$, $\angle PYQ$ and add $m\angle PXQ$, $m\angle PYQ$.
- (c) Find the measure of $\angle POQ$. Write the relation between $\angle PXQ$ and $\angle POQ$.
- (2) Two eagles are flying in the sky at height of $10\sqrt{3}$ m above the ground. A boy standing at a point on the ground looks towards the eagles making angles of elevation of 60° and 30° respectively. Find the distance between these two eagles.