



BOARD QUESTION PAPER: MARCH 2025

Mathematics Part - II

Time: 2 Hours

Max. Marks: 40

Note:

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

Q.1. (A) Choose the correct alternative from given:

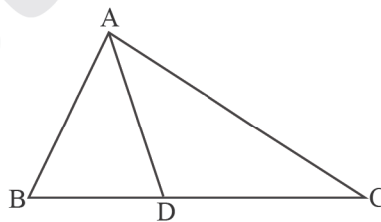
[4]

- Out of the following which is a Pythagorean triplet?
(A) (1, 5, 10) (B) (3, 4, 5)
(C) (2, 2, 2) (D) (5, 5, 2)
- $\angle ACB$ is inscribed angle in a circle with centre O. If $\angle ACB = 65^\circ$, then what is measure of its intercepted arc AXB?
(A) 65° (B) 230°
(C) 295° (D) 130°
- Distance of point (3, 4) from the origin is _____.
(A) 7 (B) 1
(C) 5 (D) -5
- If radius of cone is 5 cm and its perpendicular height is 12 cm, then the slant height is _____.
(A) 17 cm (B) 4 cm
(C) 13 cm (D) 60 cm

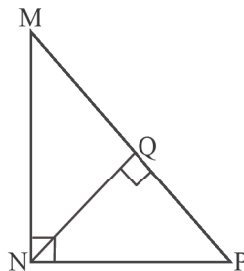
(B) Solve the following sub-questions:

[4]

- In the following figure $\triangle ABC$, B – D – C and $BD = 7$, $BC = 20$, then find $\frac{A(\triangle ABD)}{A(\triangle ABC)}$.



- In the following figure $\angle MNP = 90^\circ$, seg $NQ \perp$ seg MP , $MQ = 9$, $QP = 4$, find NQ .



- Angle made by a line with the positive direction of X-axis is 30° . Find slope of that line.
- In cyclic quadrilateral ABCD $m\angle A = 100^\circ$, then find $m\angle C$.



Q.2. (A) Complete the following activities and rewrite it (any two):

[4]

- i. The radius of a circle with centre 'P' is 10 cm. If chord AB of the circle subtends a right angle at P, find area of minor sector by using the following activity. ($\pi = 3.14$)

Activity:

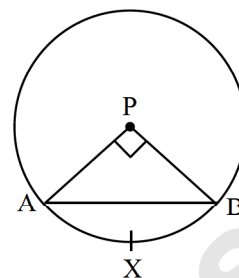
$$r = 10 \text{ cm}, \theta = 90^\circ, \pi = 3.14.$$

$$A(P-AXB) = \frac{\theta}{360} \times \boxed{}$$

$$= \frac{\boxed{}}{360} \times 3.14 \times 10^2$$

$$= \frac{1}{4} \times \boxed{}$$

$$A(P-AXB) = \boxed{} \text{ sq.cm.}$$



- ii. In the following figure chord MN and chord RS intersect at point D. If $RD = 15$, $DS = 4$, $MD = 8$, find DN by completing the following activity:

Activity:

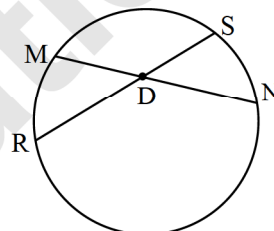
$$\therefore MD \times DN = \boxed{} \times DS \text{ _____}$$

...(Theorem of internal division of chords)

$$\therefore \boxed{} \times DN = 15 \times 4$$

$$\therefore DN = \frac{\boxed{}}{8}$$

$$\therefore DN = \boxed{}$$



- iii. An observer at a distance of 10 m from tree looks at the top of the tree, the angle of elevation is 60° . To find the height of tree complete the activity. ($\sqrt{3} = 1.73$)

Activity:

In the figure given, $AB = h$ = height of tree, $BC = 10$ m, distance of the observer from the tree.

$$\text{Angle of elevation } (\theta) = \angle BCA = 60^\circ$$

$$\tan \theta = \frac{\boxed{}}{BC} \quad \dots(i)$$

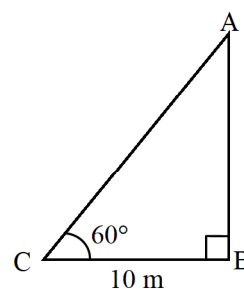
$$\tan 60^\circ = \frac{\boxed{}}{10} \quad \dots(ii)$$

$$\frac{AB}{BC} = \sqrt{3} \quad \dots[\text{from (i) and (ii)}]$$

$$AB = BC \times \sqrt{3} = 10\sqrt{3}$$

$$AB = 10 \times 1.73 = \boxed{}$$

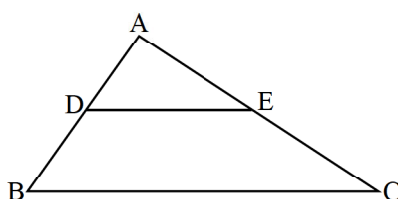
$$\therefore \text{height of the tree is } \boxed{} \text{ m.}$$



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

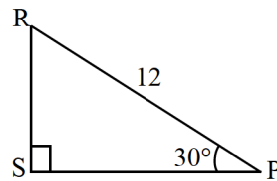
[8]

- i. In $\triangle ABC$, $DE \parallel BC$. If $DB = 5.4$ cm, $AD = 1.8$ cm, $EC = 7.2$ cm, then find AE.

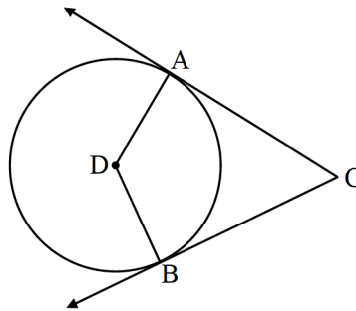




- ii. In the figure given below, find RS and PS using the information given in $\triangle PSR$.



- iii. In the following figure, circle with centre D touches the sides of $\angle ACB$ at A and B. If $\angle ACB = 52^\circ$, find measure of $\angle ADB$.



- iv. Verify, whether points, A(1, -3), B(2, -5) and C(-4, 7) are collinear or not.
- v. If $\sin \theta = \frac{11}{61}$, find the values of $\cos \theta$ using trigonometric identity.

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

[3]

- i. In the following figure, $XY \parallel \text{seg } AC$. If $2AX = 3BX$ and $XY = 9$. Complete the activity to find the value of AC.

Activity:

$$2AX = 3BX$$

...[Given]

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

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

...[by componendo]

$$\frac{\boxed{}}{BX} = \frac{5}{2}$$

...(i)

Now $\triangle BCA \sim \triangle BYX$

...[$\boxed{}$ test of similarity]

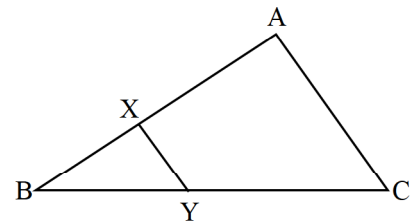
$$\therefore \frac{BA}{BX} = \frac{AC}{XY}$$

...[corresponding sides of similar triangles]

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

...[from (i)]

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



- ii. Complete the following activity to prove that the sum of squares of diagonals of a rhombus is equal to the sum of the squares of the sides.

Given:

$\square PQRS$ is a rhombus. Diagonals PR and SQ intersect each other at point T.

To prove:

$$PS^2 + SR^2 + QR^2 + PQ^2 = PR^2 + QS^2$$

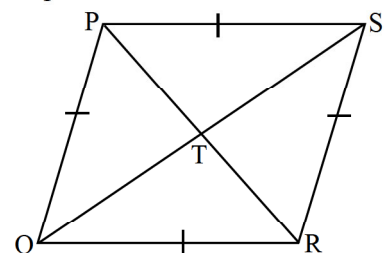
Activity:

Diagonals of a rhombus bisect each other.

In $\triangle PQS$, PT is the median and in $\triangle QRS$, RT is the median.

- $\therefore$ by Apollonius theorem,

$$PQ^2 + PS^2 = \boxed{} + 2QT^2 \quad \dots(i)$$





$$QR^2 + SR^2 = \boxed{} + 2QT^2 \quad \dots(ii)$$

adding (i) and (ii),

$$PQ^2 + PS^2 + QR^2 + SR^2$$

$$= 2(PT^2 + \boxed{}) + 4QT^2$$

$$= 2(PT^2 + \boxed{}) + 4QT^2 \quad \dots(RT = PT)$$

$$= 4PT^2 + 4QT^2$$

$$= (\boxed{})^2 + (2QT)^2$$

$$\therefore PQ^2 + PS^2 + QR^2 + SR^2 = PR^2 + \boxed{}.$$

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

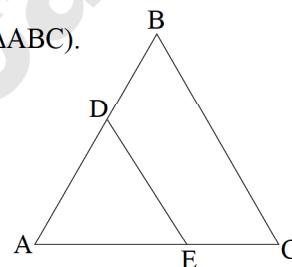
[6]

- Show that points $P(1, -2)$, $Q(5, 2)$, $R(3, -1)$, $S(-1, -5)$ are the vertices of a parallelogram.
- Prove that tangent segments drawn from an external point to a circle are congruent.
- 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.
- How many solid cylinders of radius 10 cm and height 6 cm can be made by melting a solid sphere of radius 30 cm?

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

[8]

- In the following figure $DE \parallel BC$, then:
 - If $DE = 4$ cm, $BC = 8$ cm, $A(\triangle ADE) = 25$ cm², find $A(\triangle ABC)$.
 - If $DE : BC = 3 : 5$, then find $A(\triangle ADE) : A(\square DBCE)$.



- $\triangle ABC \sim \triangle PQR$. In $\triangle ABC$, $AB = 3.6$ cm, $BC = 4$ cm and $AC = 4.2$ cm. The corresponding sides of $\triangle ABC$ and $\triangle PQR$ are in the ratio $2 : 3$, construct $\triangle ABC$ and $\triangle PQR$.
- The radii of the circular ends of a frustum of a cone are 14 cm and 8 cm. If the height of the frustum is 8 cm, find: ($\pi = 3.14$)
 - Curved surface area of frustum.
 - Total surface area of the frustum.
 - Volume of the frustum.

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

[3]

- $\square ABCD$ is a rectangle. Taking AD as a diameter, a semicircle AXD is drawn which intersects the diagonal BD at X . If $AB = 12$ cm, $AD = 9$ cm, then find the values of BD and BX .
- Taking $\theta = 30^\circ$ to verify the following Trigonometric identities:
 - $\sin^2 \theta + \cos^2 \theta = 1$
 - $1 + \tan^2 \theta = \sec^2 \theta$
 - $1 + \cot^2 \theta = \operatorname{cosec}^2 \theta$.