



P.V.G.'s
Mukhtangan English School & Jr. College,
44, Vidyanaagari, Parvati, Pune - 411009.
Terminal Examination (2025-26)
Standard - X

Subject : Mathematics - II

Marks - 40

Date : 3.10.2025

Time : 8.00 am to 10.00 am

Q1. A) Four alternative answers are given for every subquestions. Choose the correct alternative and write alphabet with subquestion number. (4)

i) The maximum number of tangents that can be drawn to a circle from a point outside it, is _____.

- A) 0 B) 3 C) 2 D) One and only one.

ii) 1 litre = _____ cm^3 .

- A) 1000 B) $\frac{1}{1000}$ C) 100 D) $\frac{1}{100}$

iii) $\Delta PQR \sim \Delta STU$ and $A(\Delta PQR) : A(\Delta STU) = 64:81$, then what is the ratio of their corresponding sides?

- A) 8:9 B) 64:81 C) 9:8 D) 16:27

iv) If a, b, c are sides of a triangle and $a^2 + b^2 = c^2$, then the type of triangle is _____ triangle.

- A) Obtuse angled B) Right angled
C) Acute angled D) Equilateral

B) Attempt the following subquestions. (4)

i) Find the value of $\operatorname{cosec} 30^\circ \times \sin 30^\circ$.

ii) Find the volume of cube having length of side 2 cm.

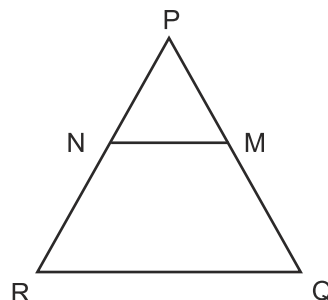
iii) State whether (4, 9, 12) is a Pythagorean triplet. Justify your answer.

iv) Draw $\angle PMR = 125^\circ$ and construct it's angle bisector.

Q.2 A) Attempt any two of the following activities by filling in the boxes.

(4)

- i) In $\triangle PQR$, if $PN = 12$, $NR = 8$,
 $PM = 15$, $MQ = 6$, then
 complete the following
 activity to justify
 whether $\text{seg } NM \parallel \text{side } RQ$.



→ Solution :

In $\triangle PQR$,

$$\frac{PN}{NR} = \boxed{} = \frac{3}{2} \quad \text{--- (1)}$$

$$\text{and } \frac{PM}{MQ} = \frac{15}{6} = \boxed{} \quad \text{--- (2)}$$

∴ From (1) and (2)

$$\frac{PN}{NR} \boxed{} \frac{PM}{NR}$$

∴ By Converse of B.P.T,

seg $NM \boxed{}$ to Side RQ .

- ii) If $\operatorname{cosec} \theta = \frac{25}{7}$, then find the value of $\cot \theta$ by completing the activity given below.

→ Solution :

$$\operatorname{cosec} \theta = \frac{25}{7} \quad \text{--- (given)}$$

By using Trigonometric Identity,

$$1 + \cot^2 \theta = \boxed{}$$

$$\therefore 1 + \cot^2 \theta = \boxed{}^2$$

On Solving

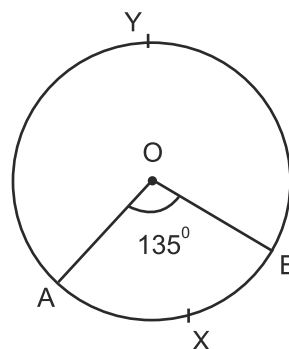
$$\cot^2 \theta = \boxed{}$$

By taking square root on both sides,

We get,

$$\cot \theta = \boxed{}$$

- iii) In the adjoining figure, 'O' is the centre of the circle. Using the given information, complete the table given below:

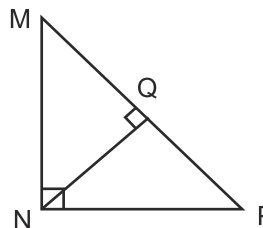


Type of arc	Name of the arc	Measure of the arc
	arcAXB	
	arcAYB	

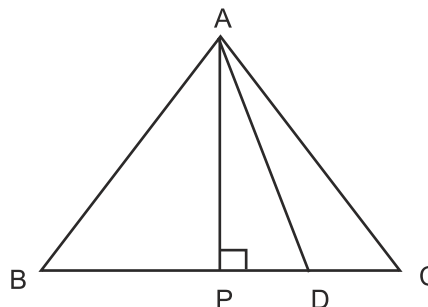
B) Attempt any four of the following subquestions. (8)

- i) Draw a circle of radius 3.1 cm. Take point A on it and construct tangent through point A.

- ii) In the adjoining figure,
 $\angle MNP = 90^\circ$, Seg $NQ \perp$ Seg MP ,
 if $\ell(MQ) = 9$ and $\ell(NQ) = 6$,
 then find $\ell(QP)$



- iii) In the adjoining figure,
 point D in $\triangle ABC$ is on side BC
 such that $DC = 10$, $BD = 15$,
 then find $A(\triangle ABD) : A(\triangle ABC)$



- iv) Eliminate θ from the equations :

$$x = 4 \sin \theta \text{ and } y = 3 \cos \theta$$

- v) The curved surface area of cylinder is 440 m^2 and its radius is 5 m. Find the height of cylinder ($\pi = \frac{22}{7}$)

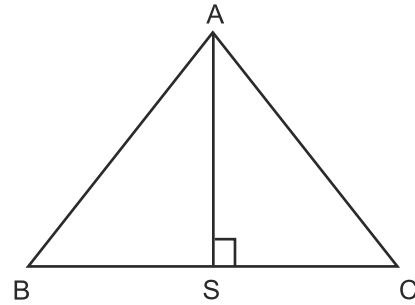
Q3. A) Attempt any one of the following activities given below.

(3)

- i) In $\triangle ABC$, Seg $AS \perp$ Side BC , then complete the activity given below to prove that,

$$AB^2 + SC^2 = AC^2 + BS^2$$

→ Solution :



In $\triangle ASB$, $\angle ASB = 90^\circ$

$$\therefore AS^2 + BS^2 = \boxed{} \text{ ——— (Pythagoras theorem)}$$

$$\therefore AS^2 = \boxed{ - } \text{ ——— ①}$$

Similarly, In $\triangle ASC$, $\angle ASC = 90^\circ$.

$$\therefore AS^2 + SC^2 = \boxed{} \text{ ——— (Pythagoras theorem)}$$

$$\therefore AS^2 = \boxed{ - } \text{ ——— ②}$$

$\therefore$ From ① and ②

$$AS^2 = \boxed{ - } = \boxed{ - }$$

$\therefore$ By rearranging the terms

$$AB^2 + SC^2 = AC^2 + BS^2 \text{ ——— Proved}$$

- ii) Show that $\cot \theta + \tan \theta = \operatorname{cosec} \theta \times \sec \theta$ by completing the activity given below :

→ Here $\cot \theta + \tan \theta = \operatorname{cosec} \theta \times \sec \theta$

$$\therefore \text{LHS} = \cot \theta + \tan \theta \quad \& \quad \text{RHS} = \operatorname{cosec} \theta \times \sec \theta \text{ ——— ①}$$

$$= \frac{\cos \theta}{\sin \theta} + \frac{\sin \theta}{\cos \theta}$$

$$= \frac{\boxed{} + \boxed{}}{\sin \theta \times \boxed{}}$$

$$= \frac{1}{\sin \theta \times \boxed{}} \text{ ——— (Reason) } \boxed{}$$

$$= \frac{1}{\sin \theta} \times \frac{1}{\boxed{}}$$

$$= \operatorname{cosec} \theta \times \sec \theta \quad \text{—————} \textcircled{2} \text{ (By relation between trigonometric ratio)}$$

$$\therefore \text{LHS} = \text{RHS} \quad \text{—————} \text{ from } \textcircled{1} \text{ \& } \textcircled{2}$$

$$\therefore \cot \theta + \tan \theta = \operatorname{cosec} \theta \times \sec \theta \quad \text{—————} \text{ Proved}$$

B) Attempt any two of the following subquestions. (6)

- i) Radii of the top and base of frustum of cone are 14 cm and 8 cm respectively having height 8 cm. Find its volume. ($\pi = 3.14$)
- ii) Prove that : 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 same proportions.
- iii) Draw a circle of radius 3 cm and centre 'O'. Take point 'F' on the circle. Take another point M such that O - F - M and FM = 4.6 cm. Hence construct tangent segments to the circle from point M.
- iv) Prove that : In a triangle if the square of one side is equal to the sum of squares of the remaining two sides, then the triangle is a right angled triangle.

Q4. Attempt any two of the following subquestions. (8)

- i) A man standing on the bank of a river observes that the angle of elevation of top of a tree on the opposite bank is 60° . When he moves 40 m away from the bank, he finds the angle of elevation to be 30° . Find
 - 1) The width of the river
 - 2) The height of the tree ($\sqrt{3} = 1.73$)
- ii) Prove that, the sum of squares of the diagonals of a rhombus is equal to the sum of the square of the sides.
- iii) $\triangle LMN \sim \triangle XYZ$. Construct $\triangle LMN$ where LM = 6 cm, MN = 6.8 cm, LN = 7.6 cm and $\frac{LM}{XY} = \frac{4}{3}$ and hence construct $\triangle XYZ$.

Q5. Attempt any one of the following subquestions. (3)

- i) Find the value of $\frac{\tan^2 \theta - \sec^2 \theta}{\cot^2 \theta - \operatorname{cosec}^2 \theta} + \sin 30^\circ + \sec 60^\circ$
- ii) Draw a circle with point P as centre and radius 3.8 cm. Take two points A and B on the circle such that $\angle APB = 130^\circ$. Construct tangents to the circle at point A and B which intersects in point Q outside the circle.



