Maharashtra Board
Class IX Mathematics
(Geometry) Sample Paper – 3

Time: 2 hours **Total Marks: 40**

Note: - (1) All questions are compulsory.
(2) Use of calculator is not allowed.

1. Attempt any five sub-questions from the following: 5

i. The perimeter of an equilateral triangle is 16.5 cm. Find the length of its side.

ii. In ΔABC, AB = 5 cm BC = 8 cm, AC = 10 cm. Find the smallest and the biggest angle of the triangle.

iii. Two equal chords AB and CD of a circle are such that the length of perpendicular OE on CD = 5 cm. If OF is the perpendicular on AB, then find OF.

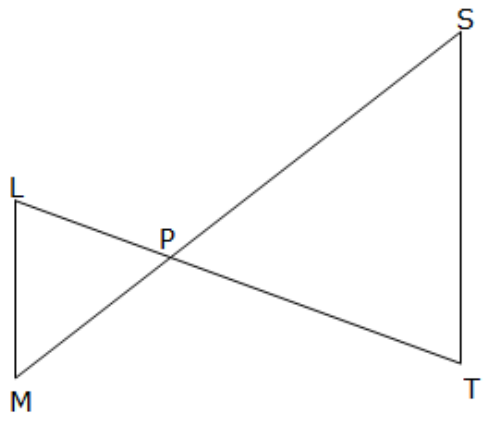
iv. Find the relation between 'x' and 'y' where point (x, y) is equidistant from (2, –4) and (–2, 6).

v. Evaluate: $\tan^2 30 + \tan^2 45 + \tan^2 60$

vi. The diagonal of a square is $5\sqrt{6}$ cm. Find its area.

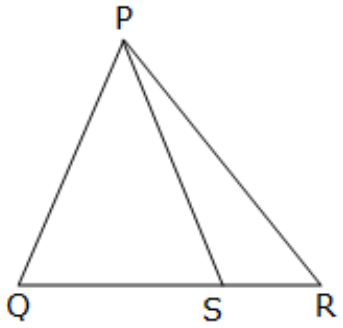
2. Attempt any four sub-questions from the following: 8

i. In the figure, LM ∥ ST, LM = 9 cm, LP = 3 cm, PT = 4 cm, PS = 12 cm. Calculate MP and ST.



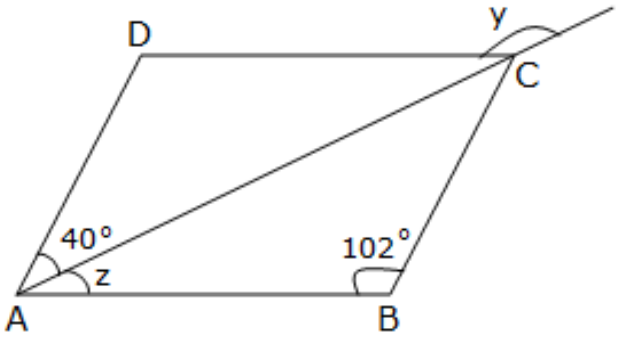
ii. Take four points P, Q, R, S in a plane. Draw lines by joining different pair of points. How many lines can you draw if three of these points are collinear?

iii. In the figure, S is any point on the side QR of ΔPQR. Prove that PQ + QR + RP > 2PS.



iv. Two chords PQ and PR of a circle are equal. Prove that the bisector of ∠RPQ passes through the centre of the circle.

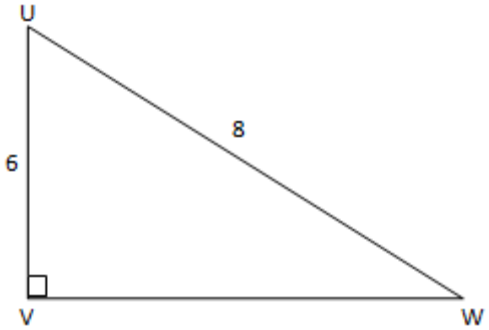
v. In the figure, ABCD is a parallelogram. Find the values of y and z.



vi. If $\sin\theta = \frac{2\sqrt{2}}{3}, \cos\theta = \frac{1}{3}$, find tan θ and cot θ.

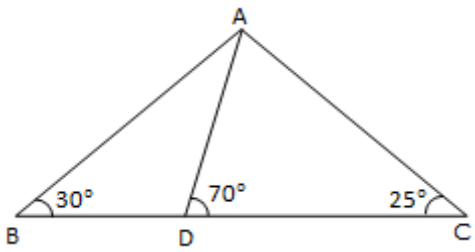
3. Attempt any three of the following sub-questions: 9

i. In the figure, ΔUVW is a right-angled triangle. ∠UVW = 90°, UV = 6 cm and UW = 8 cm. Find all trigonometric ratios of ∠W.



ii. The length of a diagonal of a square is 13 cm. Find the length of each side.

iii. In the figure, ∠ABD = 30°, ∠ADC = 70° and ∠ACD = 25°. Arrange the sides AB, AD, AC in the descending order of their lengths.

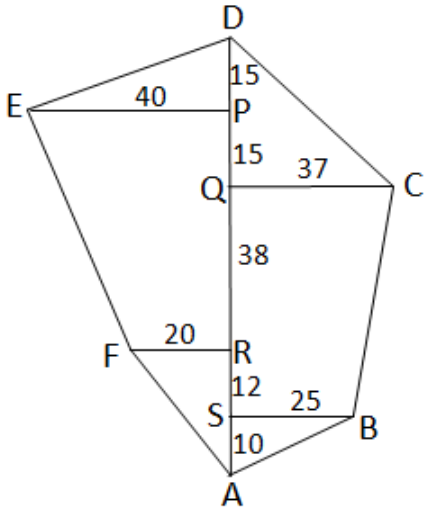


iv. The measure of an angle supplement is 10 degrees more than 3 times its complement. What is the measure of an angle?

v. Using distance formula show that the points L(1, 3), M(−1, −1) and N(−2, −3) are collinear.

4. Attempt any two sub-questions from the following: 8

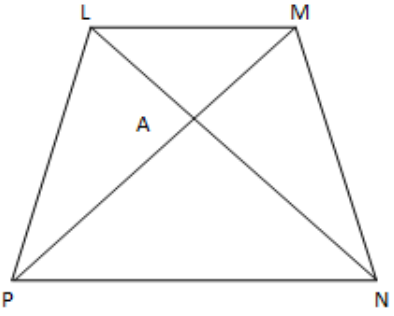
i. The polygonal field is as shown in the adjoining figure. All measurements are given in metres. Find the area of the field.



ii. In the figure, □LMNP is a trapezium in which seg PN ∥ seg LM. If PN = 12, LA = 5, LM = 8, show that

(a) ΔLAM ~ ΔNAP

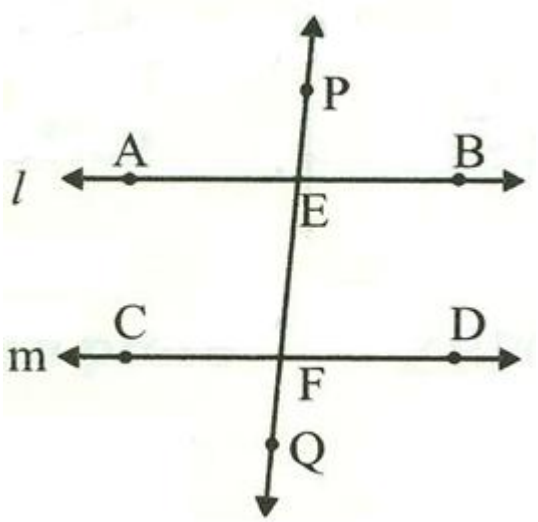
(b) Find AN.



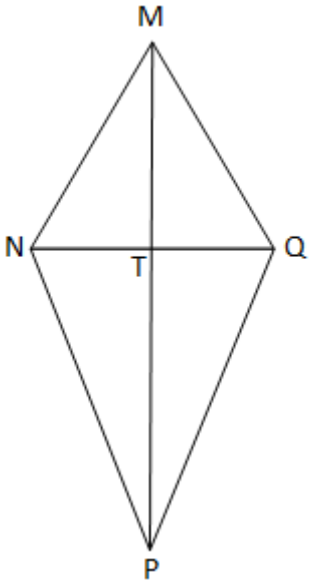
iii. Construct ΔABC where base BC = 4.7 cm, $\angle B = 45°$, and AC – AB = 2.5 cm.

5. Attempt any two of the following sub-questions: 10

i. In the following figure, line l ∥ line m and PQ is the transversal. If $\angle PEB = 70°$, find the measures of each of the remaining angles.



ii. In □MNPQ, diagonal MP is the perpendicular bisector of diagonal NQ. Then show seg MN ≅ seg MQ and seg PN ≅ seg PQ. Find the pairs of congruent triangles and justify your answer.



iii. The lengths of the diagonals PR and QS of a rhombus PQRS are 16 cm and 30 cm respectively, find the length of each side of the rhombus.