Maharashtra State Board
Class IX Mathematics – Geometry
Board Paper 1

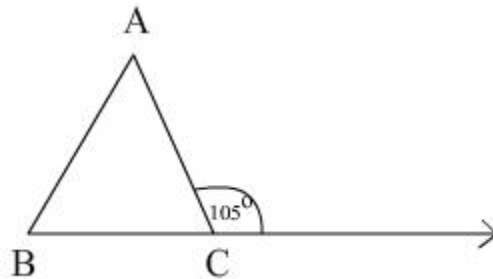**Time: 2 hours**   **Total Marks: 40**

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

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

   i.   An exterior angle of a triangle is 80° and two interior opposite angles are
        equal. Find the measure of each of these angles.

   ii. In the given figure, AB = AC and ∠ACD = 105°, find ∠BAC.


   iii. If P is the centre of the circle with radius 6.7 cm, d(P, R) = 5.7 cm, find
        the position of the point R with respect to the circle.

   iv. Find the distance between the points A(2, 5) and B(−6, 8).

   v.   Evaluate: $\dfrac{\cos 80°}{\sin 10°} + \cos 59° \times \operatorname{cosec}31°$

   vi. The side of a square- shaped field is 300 m long. Find the cost of leveling
        the field at the rate of Rs.1.25 per m².

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

   i.   In □PQRS, side QS is the angle bisector of ∠PQR and ∠PSR. Prove that:
   ΔPQS ≅ ΔRQS and ∠P ≅ ∠R.
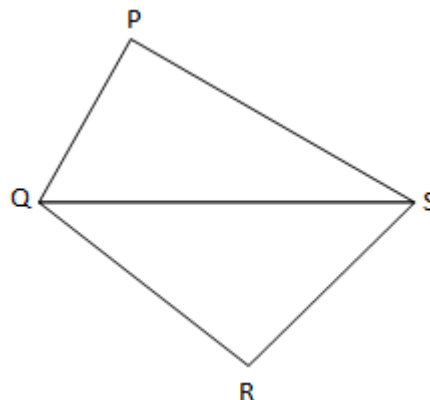
ii. Find the value of 'x' in the following figure. XY ⊥ NZ.
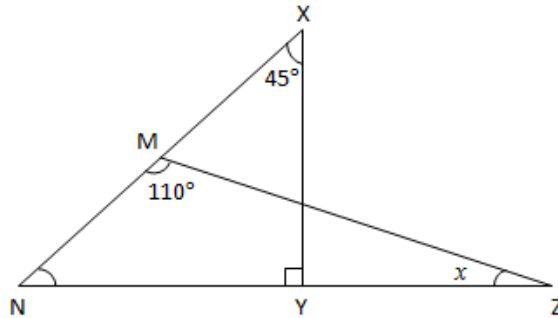
iii. Find the measure of angle 's', if the measure of angle 's' is 20 more than four times its supplement.

iv. Prove that in a circle chords which subtend congruent angles at the centre are congruent.

v. In the following figure ▱PQRS is a quadrilateral. The bisectors of ∠P and ∠Q meet at point A. ∠S = 30° and ∠R = 100°, find the measure of ∠PAQ.
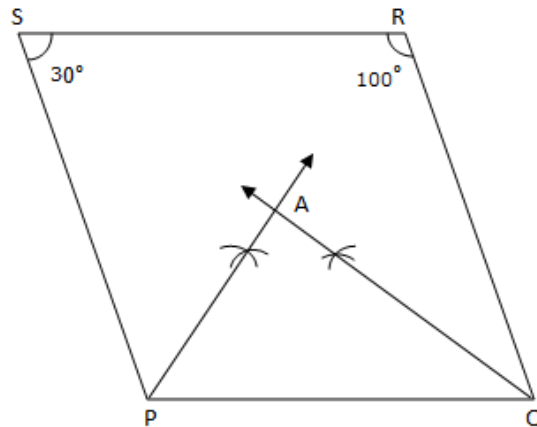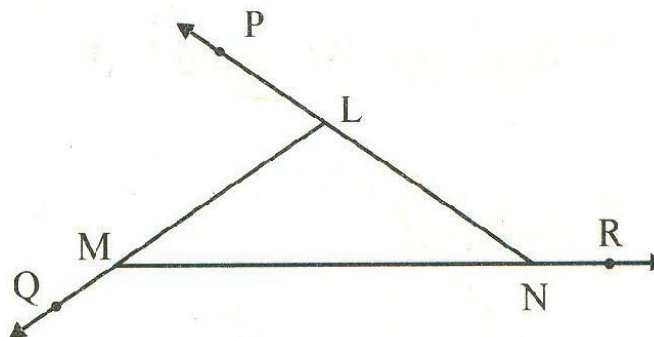

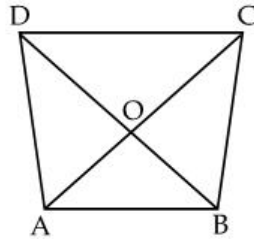vi. If ∠A = 30°, then show that $\sin A = \sqrt{\dfrac{1 - \cos 2A}{2}}$

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

i. In the figure, l(LN) = 5, l(MN) = 7, l(ML) = 6, l(NP) = 11, l(MR) = 13, l(MQ) = 2 then find l(PL), l(NR), l(LQ).

ii. In figure, show that 2(AC + BD) > (AB + BC + CD + DA)

iii. The diagonals of a rectangle PQRS intersect at M. If ∠QMR = 50°, find ∠MPS.

iv. Find the co-ordinates of the points which divide the line segment joining the points (−2, 2) and (6, −6) in four equal parts.
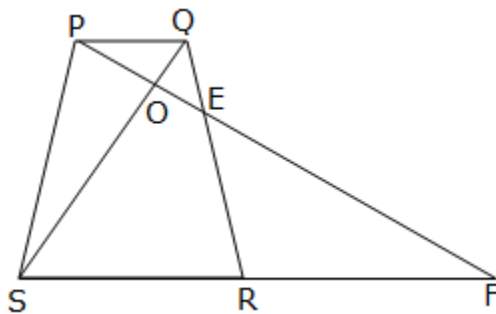
v. Find the value of the following:

(a) $\dfrac{\cos 35°}{\sin 55°} + \dfrac{\sin 11°}{\cos 79°} - \cos 28° \csc 62°$

(b) $\dfrac{\cos 81°}{\sin 9°} + \dfrac{\cos 14°}{\sin 76°}$

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

i. The base of an isosceles triangle measures 80 cm. Its area is 360 cm². Find the perimeter of the triangle.

ii. In the following trapezium PQRS, PQ = 6 cm, SR = 12 cm, RF = 9 cm, PO = 4 cm and QR = 10 cm. Calculate

   (a) ER

   (b) PF

iii. Draw ΔABC, where AB = 6 cm, BC = 4 cm, AC = 7 cm. Draw a perpendicular bisector of each side of ΔABC. In how many points do they intersect one another?

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

i. In the given figure, PQ ‖ LM. If $\angle 2 = (2x + 30)°$, $\angle 4 = (x + 2y)°$ and $\angle 6 = (3y + 10)°$, find the measure of $\angle 5$.
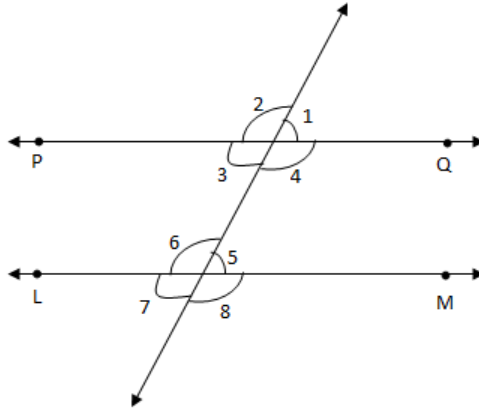
ii. In ΔABC, sides AB and BC are congruent.

(a) If A-P-C, then show that BP < congruent sides.

(b) If A-C-P, then show that BP > congruent sides.

iii. In the given figure, ▢PQRS and ▢MNRL are rectangles, where M is the mid-point of PR. Prove that SL = LR and LN = $\frac{1}{2}$SQ