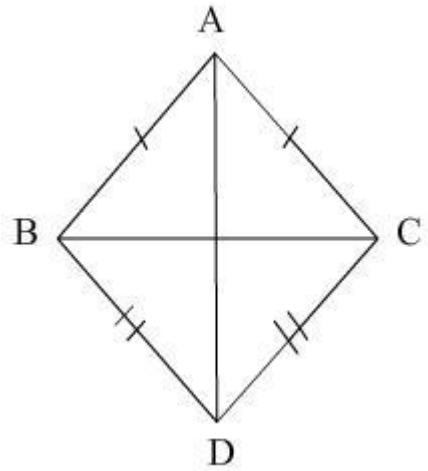
Maharashtra Board
Class IX Mathematics
(Geometry) Sample Paper – 1

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

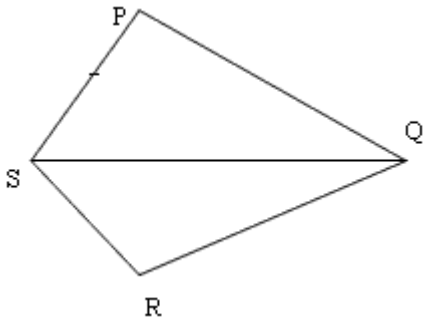
Note: (1) All questions are compulsory.
(2) Use of a calculator is not allowed.

1. Solve any five sub-questions: **5**

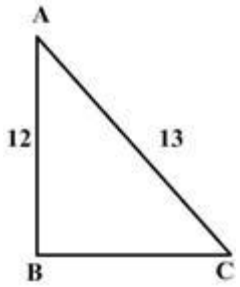
i. If two isosceles triangles are on opposite sides of a common base, then by which criterion can we say Δ ABD $\cong$ Δ ACD?



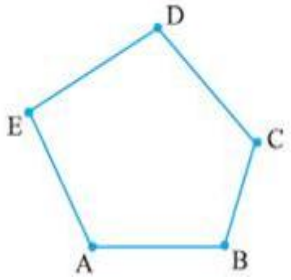
ii. In the given quadrilateral, QS is the bisector of $\angle$S and $\angle$Q. PS = 5 cm and PQ = 8cm. Find the measure of SR.



iii. In the given figure, find tan A – cot C.

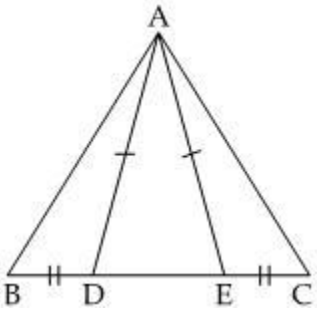


iv. Which of the Euclid's postulates implies the existence of parallel lines? Also, state the postulate.
v. State the Mid-point Theorem.
vi. Three sides of a quadrilateral are 30 cm, 40 cm and 25 cm. Find the length of its fourth side if the perimeter is 130 cm.
vii. Name the following polygon? How many pairs of adjacent sides are there in this polygon? Name them.



2. Solve any four sub-questions: 8

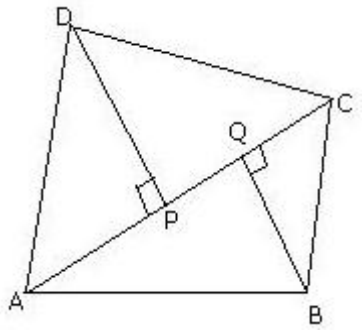
i. In the figure, D and E are points on the base BC of $\triangle ABC$ such that BD = CE and AD = AE. Prove that $\Delta ABE \cong \Delta ACD$.



ii. Give three examples each of (i) Parallel lines and (ii) Intersecting lines from your environment.
iii. If the angles of a triangle are in the ratio 1:2:3, then find the measure of the angles.

iv. Find the area of a triangle whose sides are 6.5 cm, 7 cm and 7.5 cm.

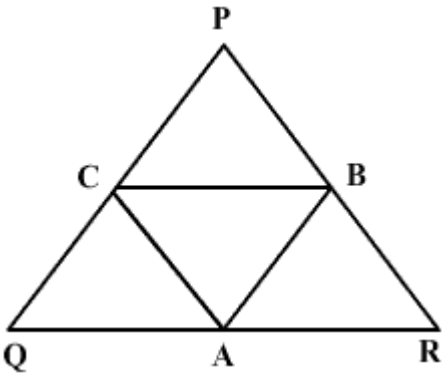
v. Find the area of the following quadrilateral ABCD, where the length of diagonal AC = 8 cm and the length of perpendiculars DP and BQ are 4.5 cm and 3.5 cm, respectively.



vi. If the point C(−1,2) divides the line segment AB in the ratio 3:4, where the coordinates of point A are (2,5), then find the coordinates of B.

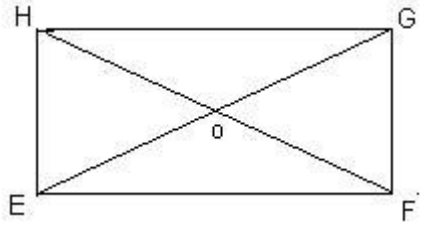
3. Solve any three sub-questions: 9

i. In ΔPQR, A, B and C are the mid-points of QR, RP and PQ, respectively. If the lengths of sides PQ, QR and RP are 7 cm, 8 cm and 9 cm, respectively, then find the perimeter of ΔABC.



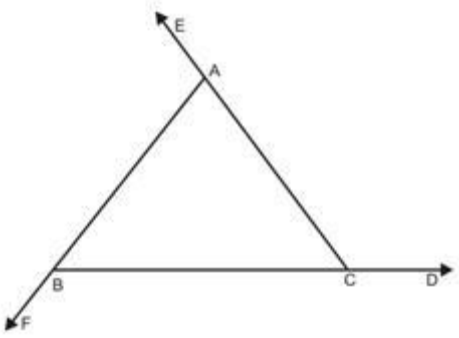
ii. Using the section formula, show that the points A(−3,−1), B(1,3) and C(−1,1) are collinear.

iii. The given figure EFGH is a rectangle with diagonals HF = 4x + 2 and EG = 5x − 1. What is the length of OH and OE?



iv. Two congruent circles interest each other at points A and B. Through point A, a line segment PAQ is drawn so that P and Q lie on the two circles. Prove that BP = BQ.

v. If the sides of a triangle are produced in order, then prove that the sum of the exterior angles so formed is equal to four right angles.

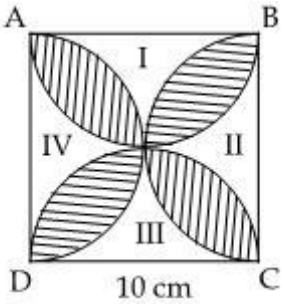


4. Solve any two sub-questions: 8

i. Construct a triangle XYZ in which m∠Y = 30°, m∠Z = 90° and XY + YZ + ZX = 11 cm.

ii. A rectangular park is 38 m long and 15 m wide. A path 3.5 m wide is constructed outside the park. Find the outer perimeter of the path.

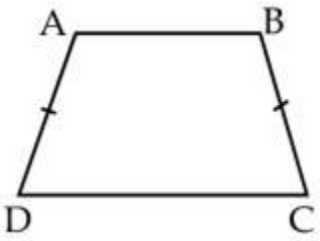
iii. In the figure, find the area of the shaded design, where ABCD is a square of side 10 cm and semicircles are drawn with each side of the square as diameter (use π = 3.14).



5. Solve any two sub-questions: **10**

i. Construct ΔPQR such that QR = 4.5 cm, $\angle$P = 40° and PQ − PR = 1.8 cm.

ii. ABCD is a trapezium in which AB||CD and AD = BC.



Show that

(a) $\angle$A = $\angle$B

(b) $\angle$C = $\angle$D

iii. Two circles of radii 10 cm and 17 cm intersect at two points, and the distance between their centres is 21 cm. Find the length of the common chord.