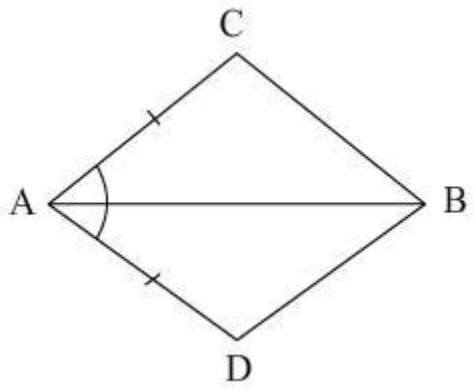
Maharashtra Board
Class IX Mathematics
(Geometry) Sample Paper – 2

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. In quadrilateral ABCD, AB bisects $\angle A$. Which criterion will prove $\Delta ABC \cong \Delta ABD$?



ii. In triangle ABC, right angled at B, AB = 5 cm, $\angle ACB = 30°$. Find the length of BC and AC.

iii. Give the equivalent version of Euclid's fifth postulate in terms of parallel lines.

iv. Find the area of a 9-sided regular polygon whose each side measures 6 cm and the radius of the inscribed circle is 8 cm.

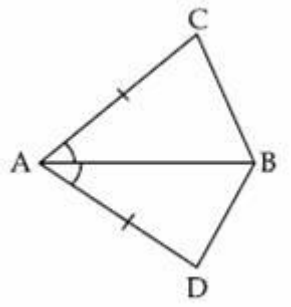
v. What is the perimeter of a polygon with area 50 sq cm and in-radius 10 cm?

vi. Find the value of 's' if the point P(0,2) is equidistant from Q(3,s) and R(s,5).

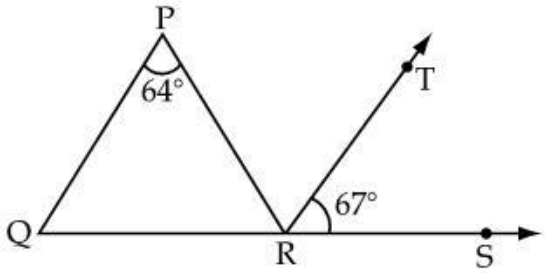
vii. What is the circumference of a circle with radius 14 cm?

2. Solve any four sub-questions: 8

i. In the figure, ABCD is a quadrilateral with AC = AD and AB bisects ∠A. Show that ΔABC ≅ ΔABD. What can you say about BC and BD?

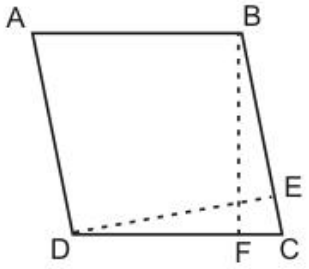


ii. In the figure, find the value of ∠QRP when QP||TR.

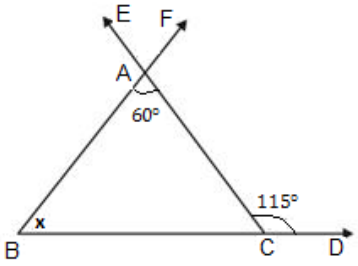


iii. Find the area of an equilateral triangle with side 10 cm.

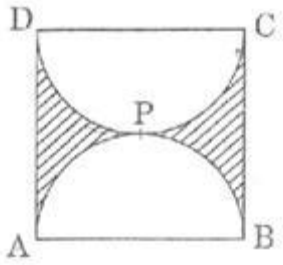
iv. In a parallelogram ABCD, AB = 20 cm. The altitude corresponding to the side AB and AD are 14 cm and 10 cm, respectively. Find AD.



v. Calculate the value of x in the given figure.



vi. Find the perimeter of the shaded region in the figure below, if ABCD is a square of side 14 cm and APB and CPD are semicircles. [Use $\pi = \frac{22}{7}$]



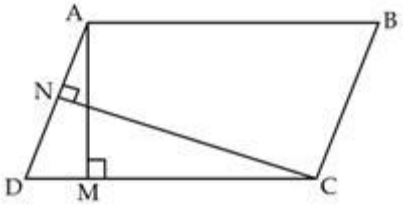
3. Solve any three sub-questions: **9**

i. ABCD is a parallelogram. What special name will you give it if the following facts are known?
(a) AB = AD, (b) ∠DAB = 90°, (c) AB = AD and ∠DAB = 90°

ii. Find a relation between x and y if the points (x, y), (1, 2) and (7, 0) are collinear.

iii. Find the area of a triangle with perimeter 22 cm, one side 9 cm and the difference of the other two sides is 7 cm.

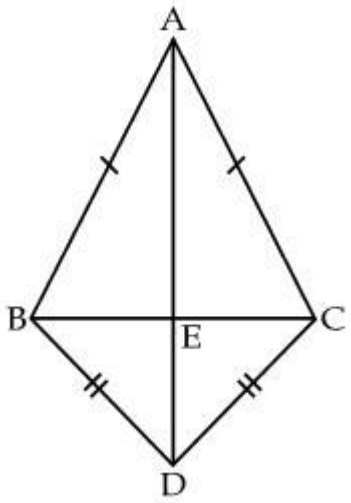
iv. ABCD is a parallelogram in which CD = 15 cm, its corresponding altitude AM is 8 cm and CN ⊥ AD. If CN = 10 cm, then find the length of AD.



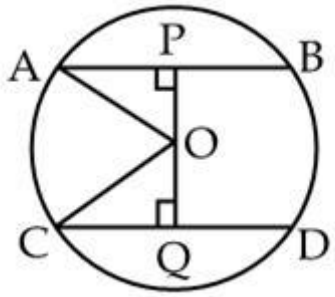
v. Prove that the triangle formed by joining the mid-points of the sides of an isosceles triangle is an isosceles triangle.

4. Solve any two sub-questions: **8**

i. In the figure, two isosceles triangles have a common base. Prove that the line segment joining their vertices bisects the common base at right angles.



ii. In the figure, O is the centre of the circle of radius 5 cm. OP ⊥ AB, OQ. ⊥ CD, AB||CD. $\overline{AB}$ = 6 cm, $\overline{CD}$ = 8 cm. Determine PQ.



iii. The sides of a triangle are in the ratio 3:5:7, and its perimeter is 300 m. Find its area.

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

i. Construct a $\triangle$ABC in which BC = 4.5 cm, $\angle$B = 45° and AB − AC = 2.5 cm. Justify the construction.

ii. If the diagonals of a rhombus are 10 cm and 24 cm, then find the length of each side.

iii. Two equal chords AB and CD of a circle intersect at point P. Prove that PB = PD.