

PRACTICE PAPER 12 (2024-25)
CHAPTER-10 HERON'S FORMULA

SUBJECT: MATHEMATICS

MAX. MARKS : 40

CLASS : IX

DURATION : 1½ hrs

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 20 questions divided into five Sections A, B, C, D and E.
- (iii). Section A comprises of 10 MCQs of 1 mark each. Section B comprises of 4 questions of 2 marks each. Section C comprises of 3 questions of 3 marks each. Section D comprises of 1 question of 5 marks each and Section E comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted

SECTION – A**Questions 1 to 10 carry 1 mark each.**

1. The length of each side of an equilateral triangle having an area of $9\sqrt{3}$ cm² is
(a) 8 cm (b) 36 cm (c) 4 cm (d) 6 cm
2. The perimeter of an equilateral triangle is 60 m. The area is
(a) $10\sqrt{3}$ m² (b) $15\sqrt{3}$ m² (c) $20\sqrt{3}$ m² (d) $100\sqrt{3}$ m²
3. The height of an equilateral triangle is 6 cm. Its area is
(a) $12\sqrt{3}$ cm² (b) $6\sqrt{3}$ cm² (c) $12\sqrt{3}$ cm² (d) 18 cm²
4. The lengths of three sides of a triangle are 20 cm, 16 cm and 12 cm. The area of the triangle is
(a) 96 cm² (b) 120 cm² (c) 144 cm² (d) 160 cm²
5. If the side of rhombus is 10 cm and one diagonal is 12 cm, then area of rhombus is
(a) 96 cm² (b) 48 cm² (c) 72 cm² (d) 80 cm²
6. The area of an equilateral triangle with side $4\sqrt{3}$ cm is
(a) 20 cm² (b) $20\sqrt{3}$ cm² (c) 18.784 cm² (d) 20.784 cm²
7. The base of a right triangle is 8 cm and hypotenuse is 10 cm. Its area will be
(a) 24 cm² (b) 40 cm² (c) 48 cm² (d) 80 cm²
8. Sides of a triangle are 8 cm, 11 cm and 13 cm. Then value of 's' is
(a) 19 cm (b) 20 cm (c) 21.5 cm (d) 16 cm

In the following questions 9 and 10, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true but R is not the correct explanation of A.
- (c) A is true but R is false.
- (d) A is false but R is true.

9. **Assertion (A):** Area of an equilateral triangle having each side 4 cm is $4\sqrt{3}$ cm²

Reason (R): Area of an equilateral triangle = $\frac{\sqrt{3}}{4} \times (\text{Side})^2$

10. **Assertion (A):** Area of a triangle is 6 cm² whose sides are 3 cm, 4 cm and 5 cm respectively.

Reason (R): Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

SECTION – B

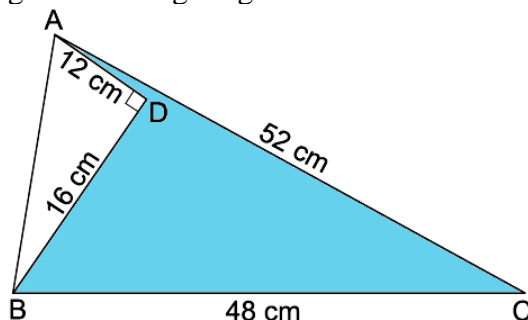
Questions 11 to 14 carry 2 marks each.

11. The perimeter of an isosceles triangle is 32 cm. The ratio of equal side to the base is 3 : 2 Using Heron's formula, find the area of triangle.
12. Two adjacent sides of a parallelogram measures 5 cm and 3.5 cm. One of its diagonal measures 6.5 cm. Find the area of the parallelogram.
13. Find the area of a triangle two sides of which are 18 cm and 10 cm and the perimeter is 42 cm.
14. The sides of a triangle are in the ratio 13 : 14 : 15 and its perimeter is 84 cm. Find the area of the triangle.

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. The triangular side walls of a flyover have been used for advertisements. The sides of the walls are 13 m, 14 m, 15 m. The advertisements yield an earning of Rs. 2000 per m² a year. A company hired one of its walls for 6 months. How much rent did it pay?
16. Find the area of the shaded region in the figure given below.

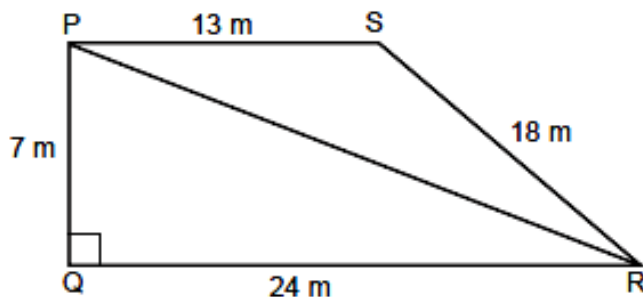


17. The perimeter of a triangle is 50 cm. One side of the triangle is 4 cm longer than the smallest side and the third side is 6 cm less than twice the smallest side. Find the area of the triangle.

SECTION – D

Questions 18 carry 5 marks.

18. The students of a school staged a rally for cleanliness campaign. They walked through the lanes in two groups. One group walked through the lanes PQ, QR and RP; while the other group walked through PR, RS and SP as shown in figure:



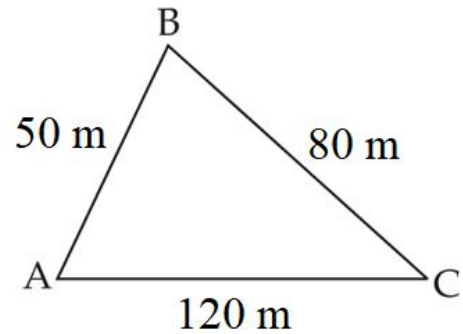
These two groups cleaned the area enclosed within their lanes. If $PQ = 7$ m, $QR = 24$ m, $RS = 18$ m, $SP = 13$ m and $\angle Q = 90^\circ$;

- (i) Which group cleaned more area and by how much?
- (ii) Find the total area cleaned by the students (neglecting the width of the lane).

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

- 19.** In my colony a park is situated in front of my house. This park has built in shape of triangle (ABC) with the following sides 120m, 80m and 50m. Now-a-days, some animals entered park and destroy and eat plants. So, our ward member of area has decided to put railing around the park for protecting plants and grass. Ward member ordered to a gardener to place a railing all around this park and maintain grass inside park. He also sanctioned an amount to improve park in a proper way for public of that colony. Costing is decided Rs. 10 per meter for railing around the park.



- (i) What is the perimeter of the park? [1]
- (ii) Calculate the semi-perimeter of triangle park, in which planting is needed? [2]
- (iii) Calculate the area, in which planting is needed? [2]

OR

- (iii) Find the cost of fencing it with barbed wire at the rate of Rs 20 per metre leaving a space 3m wide for a gate on one side. [2]

- 20.** Triangles are used in bridges because they evenly distribute weight without changing their proportions. When force is applied on a shape like a rectangle it would flatten out. Before triangles were used in bridges, they were weak and could not be very big. To solve that problem engineers would put a post in the middle of a square and make it more sturdy. Isosceles triangles were used to construct a bridge in which the base (unequal side) of an isosceles triangle is 4 m and its perimeter is 20 m.



- (i) What is the length of equal sides? [1]
- (ii) In a $\triangle ABC$ it is given that base = 12 m and height = 5 m. Find its area. [1]
- (iii) What is the area of the given isosceles triangle? [2]

OR

- (iii) Find the cost of covering the border of one isosceles triangle at the rate of Rs 200 per metre. [2]