CHAPTER TEST: HERON'S FORMULA

Mathematics | Class IX (2026/HERON/09/NCERT/001)

Time: 1.5 Hours **Max. Marks: 33**

GENERAL INSTRUCTIONS

– All questions are compulsory.

– Section A: 5 MCQs (1 mark each).

– Section B: 4 Short Answer Questions (2 marks each).

– Section C: 4 Long Answer Questions (4 marks each).

– Section D: 4 Objective/NCERT Highlight Questions (1 mark each).

Section A: Multiple Choice Questions (1 Mark Each)

1. The semi-perimeter of an equilateral triangle with side a is:
   (a) $\frac{a}{2}$ (b) $\frac{3a}{2}$ (c) $3a$ (d) $\sqrt{3}a$

2. The sides of a triangle are in the ratio $3 : 4 : 5$ and its perimeter is 144 cm. The area of the triangle is:
   (a) 864 cm^2 (b) 464 cm^2 (c) 564 cm^2 (d) 764 cm^2

3. The area of an isosceles triangle having base 2 cm and the length of one of the equal sides 4 cm is:
   (a) $\sqrt{15}$ cm^2 (b) $\sqrt{\frac{15}{2}}$ cm^2 (c) $2\sqrt{15}$ cm^2 (d) $4\sqrt{15}$ cm^2

4. If the area of an equilateral triangle is $16\sqrt{3}$ cm^2, then the perimeter of the triangle is:
   (a) 48 cm (b) 24 cm (c) 12 cm (d) 36 cm

5. In Heron's formula, s stands for:
   (a) Side (b) Surface Area (c) Semi-perimeter (d) Sum of sides

Section B: Short Answer Questions (2 Marks Each)

6. Find the area of a triangle, two sides of which are 18 cm and 10 cm and the perimeter is 42 cm.

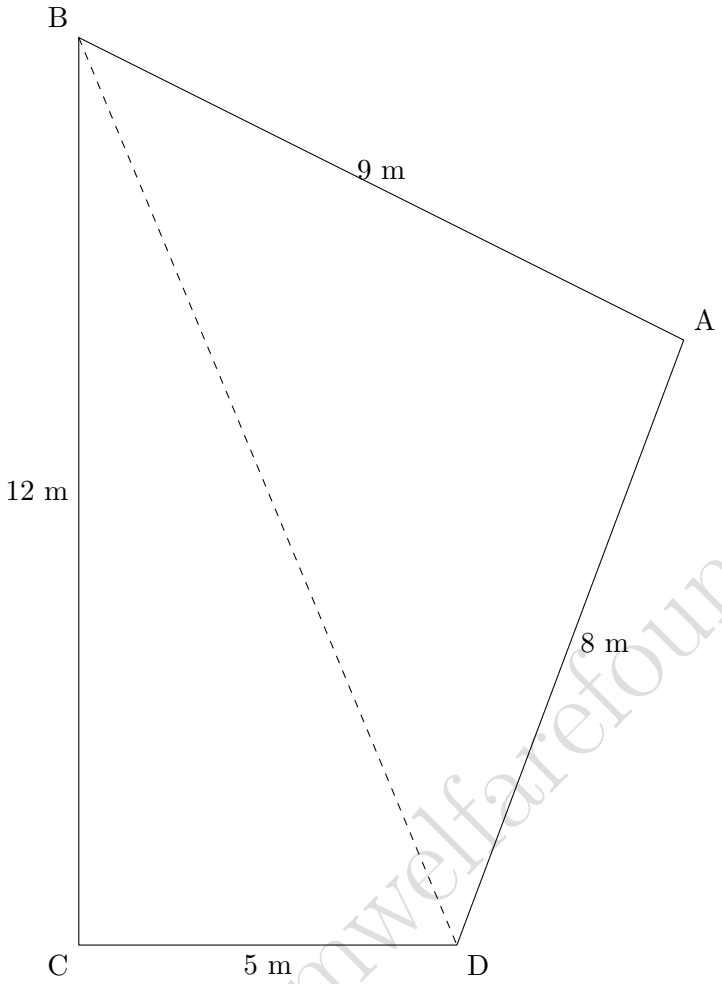
7. Find the area of an isosceles triangle whose equal sides are 12 cm each and the third side is 30 cm. Does such a triangle exist? Justify.

8. An isosceles right triangle has area 8 cm^2. Find the length of its hypotenuse.

9. The perimeter of a triangular field is 450 m and its sides are in the ratio $13 : 12 : 5$. Find the area of the field.

Section C: Long Answer Questions (4 Marks Each)

10. A park, in the shape of a quadrilateral $ABCD$, has $\angle C = 90°$, $AB = 9$ m, $BC = 12$ m, $CD = 5$ m and $AD = 8$ m.



How much area does it occupy?

11. A triangular park in a city has sides 120 m, 80 m and 50 m. A gardener Dhania has to put a fence all around it and also plant grass inside. How much area does she need to plant? Find the cost of fencing it with barbed wire at the rate of Rs 20 per metre leaving a space 3 m wide for a gate on one side.

12. Find the area of a rhombus whose perimeter is 80 m and one of whose diagonals is 24 m.

13. A floral design on a floor is made up of 16 tiles which are triangular, the sides of the triangle being 9 cm, 28 cm and 35 cm. Find the cost of polishing the tiles at the rate of 50 p per cm^2.

Section D: NCERT Important Highlights (1 Mark Each)

1. The formula given by Heron for the area of a triangle is $\sqrt{s(s-a)(s-b)(s-c)}$, where a, b, c are _____.

2. If the side of an equilateral triangle is doubled, its area becomes _____ times the original area.

3. The area of a quadrilateral $ABCD$ can be found by dividing it into two _____ and applying Heron's formula.

4. Area of a triangle is also given by $\frac{1}{2} \times$ base$\times$ _____.

SOLUTIONS & PREPARATION GUIDE

High-Yield NCERT Checklist

To score well in Heron's Formula, focus on these application-based problems:

- **Umbrella/Floral Design:** Problems involving multiple identical triangular pieces.
- **Quadraliteral Area:** Finding the diagonal using Pythagoras theorem before applying Heron's formula.
- **Traffic Signal Board:** Proving the area of an equilateral triangle using Heron's formula ($A = \frac{\sqrt{3}}{4}s^2$).
- **Unit Conversion:** Ensure sides are in the same units before calculating 's'.