CHAPTER TEST: HERON'S FORMULA (HOTS)

Mathematics | Class IX | (2026/HERON-HOTS/09/001)

Time: 1.5 Hours   **Max. Marks: 40**

General Instructions:

- All questions are compulsory.

- Section A: 8 MCQs (1 mark each).

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

- Section C: 3 Short Answer Questions (3 marks each).

- Section D: 3 Long Answer/HOTS questions (5 marks each).

Section A: Multiple Choice Questions (1 Mark Each)

1. The sides of a triangle are 56 cm, 60 cm and 52 cm long. The area of the triangle is:

   (a) 1322 cm^2 (b) 1344 cm^2 (c) 1392 cm^2 (d) 1442 cm^2

2. The area of an equilateral triangle is $16\sqrt{3}$ cm^2. Its perimeter is:

   (a) 48 cm   (b) 24 cm   (c) 12 cm   (d) 36 cm

3. Each side of an equilateral triangle is doubled. The percentage increase in its area is:

   (a) 100%   (b) 200%   (c) 300%   (d) 400%

4. The base of a right triangle is 8 cm and its hypotenuse is 10 cm. Its area is:

   (a) 24 cm^2 (b) 40 cm^2 (c) 48 cm^2 (d) 80 cm^2

5. The sides of a triangular board are 13 cm, 14 cm and 15 cm. The cost of painting it at the rate of Rs 5 per cm^2 is:

   (a) Rs 420   (b) Rs 400   (c) Rs 840   (d) Rs 540

6. An isosceles right triangle has area 8 cm^2. The length of its hypotenuse is:

   (a) $\sqrt{32}$ cm   (b) $\sqrt{16}$ cm   (c) $\sqrt{48}$ cm   (d) $\sqrt{24}$ cm

7. If the perimeter of an equilateral triangle is 60 m, then its area is:

   (a) $10\sqrt{3}$ m^2 (b) $15\sqrt{3}$ m^2 (c) $100\sqrt{3}$ m^2 (d) $200\sqrt{3}$ m^2

8. The area of an isosceles triangle with sides a, a and b is:

   (a) $\frac{b}{4}\sqrt{4a^2 - b^2}$ (b) $\frac{a}{4}\sqrt{4a^2 - b^2}$ (c) $\frac{b}{2}\sqrt{a^2 - b^2}$ (d) $\frac{b}{4}\sqrt{a^2 - b^2}$

Section B: Short Answer Questions (2 Marks Each)

1. The perimeter of a triangular field is 420 m and its sides are in the ratio 6 : 7 : 8. Find the area of the field.

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

3. The base of an isosceles triangle is 24 cm and its area is 192 cm^2. Find its perimeter.

4. Find the area of an equilateral triangle if its altitude is 6 cm.

Section C: Short Answer Questions (3 Marks Each)

1. A rhombus shaped field has green grass for 18 cows to graze. If each side of the rhombus is 30 m and its longer diagonal is 48 m, how much area of grass field will each cow be getting?

2. The sides of a quadrilateral $ABCD$ are 6 cm, 8 cm, 12 cm and 14 cm respectively. The angle between the first two sides is a right angle. Find its area.

3. 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: Long Answer / HOTS Questions (5 Marks Each)

1. A field is in the shape of a trapezium whose parallel sides are 25 m and 10 m. The non-parallel sides are 14 m and 13 m. Find the area of the field.

2. A triangle and a parallelogram have the same base and the same area. If the sides of the triangle are 26 cm, 28 cm and 30 cm, and the parallelogram stands on the base 28 cm, find the height of the parallelogram. Also, find the ratio of the altitude of the triangle to the height of the parallelogram.

3. The perimeter of a right triangular park is 120 m. Its hypotenuse is 50 m. Find the area of the park using Heron's formula. Verify the result using the formula $\frac{1}{2} \times$ base $\times$ height.