

**CLASS IX: MATHS**  
**Chapter 10: Heron's formula**

**Questions and Solutions | Exercise 10.1 - NCERT Books**

**Q1.** A traffic signal board, indicating 'SCHOOL AHEAD', is an equilateral triangle with side 'a'. Find the area of the signal board, using Heron's formula. If its perimeter is 180 cm, what will be the area of the signal board ?

**Sol.** The equilateral triangle each side = a

$$\text{Its semiperimeter} = \frac{a + a + a}{2} = \frac{3}{2}a$$

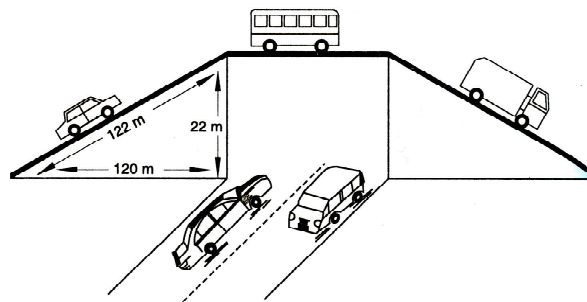
By Heron's formula, the area of the triangle

$$= \sqrt{\frac{3}{2}a \times \left(\frac{3}{2}a - a\right) \times \left(\frac{3}{2}a - a\right) \times \left(\frac{3}{2}a - a\right)} = \frac{\sqrt{3}}{4} a^2$$

When perimeter of the triangle is 180 cm, we have  $3a = 180$  cm i.e.,  $a = 60$  cm. Then the area of the triangle

$$= \frac{\sqrt{3}}{4} (60)^2 \text{ cm}^2 = 900\sqrt{3} \text{ cm}^2$$

**Q2.** The triangular side walls of a flyover have been used for advertisements. The sides of the walls are 122 m, 22 m and 120 m (see Fig.). The advertisements yield as earning of Rs. 5000 per  $\text{m}^2$  per year. A company hired one of its walls for 3 months. How much rent did it pay ?



**Sol.** Sides of the two equal triangular walls below the bridge are 122m, 22m and 120m.

$$s = \frac{122\text{m} + 22\text{m} + 120\text{m}}{2} = 132\text{m}$$

Area of one triangular wall

$$= \sqrt{132 \times (132 - 122) \times (132 - 22) \times (132 - 120)} \text{ m}^2$$

$$= \sqrt{132 \times 10 \times 110 \times 12} \text{ m}^2 = 1320 \text{ m}^2$$

