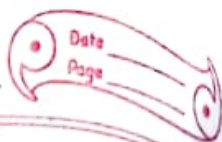


H/W
8/08/21

CH-12 HERON'S FORMULA



Ex. 12.1

Q1) if each side is equal
sum of all sides = $3a = 180 \text{ cm}$, $a = \frac{180}{3} \text{ cm}$

Semiperimeter = 90 cm

$$\text{Area} = \sqrt{90(90-60)(90-60)(90-60)}$$

$$= \sqrt{90 \times 30 \times 30 \times 30} = \sqrt{2 \times 3 \times 3 \times 5 \times 3 \times 2 \times 3 \times 3 \times 2 \times 3 \times 3 \times 3 \times 3}$$

$$\Rightarrow 4 \times 3 \times 3 \times 5 \times \sqrt{3} \Rightarrow 90\sqrt{3} \text{ cm}^2.$$

Q2) sides of $\triangle ABC$ are 12 m , 22 m , 120 m .

Perimeter = 264 m .

$$\text{Semiperimeter} = \frac{264}{2} = 132 \text{ m}.$$

By heron's formula, area = $\sqrt{s(s-a)(s-b)(s-c)}$

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

Given, rent = $35000/\text{m}^2$.

$$\text{rent of 1 wall for 3 months} = \frac{1320 \times 35000 \times 3}{12}$$

$$\Rightarrow ₹ 1650000$$

Q3) Given sides of wall = 15 m , 11 m , 6 m .

$$\text{Semiperimeter} = \frac{15 + 11 + 6}{2} = \frac{16 \text{ m}}{2} = 8 \text{ m}.$$

$$\text{Using heron's formula} = \sqrt{8 \times 1 \times 5 \times 10} = \sqrt{800} \text{ m}^2$$

$$= 20\sqrt{2} \text{ m}^2.$$

Q4) Let 2nd side be x ,
3 sides 18 cm, 16 cm, x cm,

perimeter = 42 cm.

$$x = 42 - (18 + 16) \text{ cm} = 18$$

\therefore The semi perimeter of $\Delta = \frac{42}{2}$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{21 \times 3 \times 18 \times 7} = 21\sqrt{11} \text{ cm}^2$$

Q5) The given ratio = 12 : 11 : 25

Let the sides be $12x$, $11x$ and $25x$,

$$\text{perimeter} = 540 = 12x + 11x + 25x,$$

$$x = 10$$

So sides are 120, 110, 250 cm.

semiperimeter = 240 cm.

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)} = \sqrt{240 \times 120 \times 110 \times 20} \text{ cm}^2 = 9600 \text{ cm}^2$$

Q6) Let 3rd side be x .

Equal sides = 12 cm.

perimeter = 30 cm.

$$x + 2(12) = 30 \Rightarrow x = 6 \text{ cm.}$$

semiperimeter = $\frac{30}{2} = 15 \text{ cm.}$

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\Rightarrow \sqrt{15 \times 3 \times 3 \times 9}$$

$$\Rightarrow 9\sqrt{3 \times 3} = 9\sqrt{15} \text{ cm}^2$$