Exercise 12.1 27/09/21

Q4) · Perimeter = 42
two sides = 18 and 10 cm

third side = 42 - (18 + 10)
⇒ 42 - 28
⇒ 14 cm

Area of triangles -

$s = \frac{42}{2} = 21$ cm

Area = $\sqrt{21(21-18)(21-10)(21-14)}$ cm²
= $\sqrt{21 \times 3 \times 11 \times 7}$ cm²
⇒ $\sqrt{3 \times 7 \times 3 \times 11 \times 7}$ cm²
⇒ $3 \times 7\sqrt{11}$ cm²
⇒ $21\sqrt{11}$ cm² .

Q5) let the three sides be 12x, 17x, 25x.
Perimeter = 540 cm.

⇒ 12x + 17x + 25x = 540
⇒ 54x = 540
⇒ $x = \frac{540}{54}$ ⇒ x = 10

sides = 12 × 10 = 120 cm
17 × 10 = 170 cm
25 × 10 = 250 cm

Area of triangle -

$s = \frac{120 + 170 + 250}{2} = \frac{540}{2} = 270$ cm

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Area = $\sqrt{270(270-120)(270-170)(670-250)}$ cm²

= $\sqrt{270 \times 150 \times 100 \times 20}$ cm²

= $\sqrt{3\times3\times3\times2\times5 \times 3\times5\times2\times5 \times 2\times5\times2\times5 \times 2\times2\times5}$ cm²

= $3\times3\times2\times5\times2\times5\times2\times5$ cm²

= 9000 cm²

Example

2. Sides of park = 120m, 80m, 50m

$s = \frac{120+80+50}{2} \Rightarrow s = \frac{250}{2} = 125$ m

Area = $\sqrt{125(125-120)(125-80)(125-50)}$ m²

= $\sqrt{125\times5\times45\times75}$ m²

= $\sqrt{5\times5\times5\times5\times3\times3\times5\times5\times5}$ m²

$\Rightarrow 5\times5\times3\times5\sqrt{3\times5}$ m²

$\Rightarrow 375\sqrt{15}$

Perimeter = 120 + 80 + 50

= 250m

Length of wire needed = 250 − 3m

= 247m

Cost of fencing = ₹20 × 247

= ₹4940

Diplomat

3. Let the side of a triangle be $3x$; $5x$; $7x$.

Perimeter = 300m

$3x + 5x + 7x = 300\ m$

$\Rightarrow \quad 15x = 300m$

$\Rightarrow \quad x = \frac{300}{15} \qquad \Rightarrow x = 20\ m.$

Sides = $3 \times 20 = 60m$

$5 \times 20 = 100\ m$

$7 \times 20 = 140\ m$

$S = \frac{60 + 100 + 140}{2} = \frac{300}{2} = 150$

$\text{Area} = \sqrt{150(150-60)(150-100)(150-140)}$

$= \sqrt{150 \times 90 \times 50 \times 1}$

$= \sqrt{3 \times 5 \times 2 \times 5 \times 3 \times 3 \times 2 \times 5 \times 5 \times 2 \times 5 \times 1}$

$\Rightarrow 5 \times 2 \times 3 \times 5\sqrt{3 \times 2 \times 5}$

$\Rightarrow 150\sqrt{30}$