



Exercise 17A

Question 1:

$$\begin{aligned}\text{Area of given triangle} &= \frac{1}{2} \times \text{Base} \times \text{Height} \\ &= \left(\frac{1}{2} \times 24 \times 14.5 \right) \text{cm}^2 = 174 \text{cm}^2\end{aligned}$$

Question 2:

If the cost of sowing the field is Rs. 58, then area = 10000 m²

$$\text{If the cost of sowing is Re. 1, area} = \frac{10000}{58} \text{m}^2$$

$$\text{If the cost of sowing is Rs. 783, area} = \left(\frac{10000}{58} \times 783 \right) \text{m}^2$$

$$\therefore \text{Area of the field} = 135000 \text{m}^2$$

Let the altitude of the field be x meters

Then, Base = 3x meter

$$\therefore \text{Area of the field} = \left(\frac{1}{2} \times 3x \times x \right) \text{m}^2 = \frac{3x^2}{2} \text{m}^2$$

$$\therefore \frac{3x^2}{2} = 135000$$

$$\Rightarrow x^2 = \frac{135000 \times 2}{3} = 90000$$

$$\Rightarrow x = \sqrt{90000} = 300 \text{ m}$$

Altitude = 300 m

$$\therefore \text{base} = 3 \times 300 = 900 \text{ m}$$

Hence, the altitude = 300m and the base = 900 m

Question 3:

Let $a = 42$ cm, $b = 34$ cm and $c = 20$ cm

$$\text{Then, } s = \frac{1}{2}(42 + 34 + 20) \text{ cm} = 48 \text{ cm}$$

$$(s - a) = 6 \text{ cm, } (s - b) = 14 \text{ cm and } (s - c) = 28 \text{ cm}$$

$$\begin{aligned} \text{(i) Area of triangle} &= \sqrt{s(s-a)(s-b)(s-c)} \\ &= \sqrt{48 \times 6 \times 14 \times 28} \text{ cm}^2 = 336 \text{ cm}^2 \end{aligned}$$

(ii) Let base = 42 cm and corresponding height = h cm

$$\text{Then area of triangle} = \left(\frac{1}{2} \times 42 \times h \right) \text{ cm}^2 = (21h) \text{ cm}^2$$

$$21h = 336 \Rightarrow h = \frac{336}{21} = 16 \text{ cm}$$

Hence, the height corresponding to the longest side = 16 cm

Question 4:

Let $a = 18$ cm, $b = 24$ cm, $c = 30$ cm

Then, $2s = (18 + 24 + 30) \text{ cm} = 72 \text{ cm}$

$s = 36$ cm

$(s - a) = 18$ cm, $(s - b) = 12$ cm and $(s - c) = 6$ cm

$$\begin{aligned} \text{(i) Area of triangle} &= \sqrt{s(s-a)(s-b)(s-c)} \\ &= \sqrt{36 \times 18 \times 12 \times 6} \text{ cm}^2 = 216 \text{ cm}^2 \end{aligned}$$

(ii) Let base = 18 cm and altitude = x cm

$$\text{Then, area of triangle} = \left(\frac{1}{2} \times 18 \times x \right) = 9x \text{ cm}^2$$

$$9x = 216 \Rightarrow x = \frac{216}{9} = 24$$

Hence, altitude corresponding to the smallest side = 24 cm

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