Exercise 17A

Question 1:

$$\text{Area of given triangle} = \frac{1}{2} \times \text{Base} \times \text{Height}$$

$$= \left(\frac{1}{2} \times 24 \times 14.5\right) cm^2 = 174 cm^2$$

Question 2:

If the cost of sowing the field is Rs. 58, then area = 10000 m^2

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

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

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

Let the attitude of the field be x meters

Then, Base = 3x meter

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

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

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

$\Rightarrow \quad x = \sqrt{90000} = 300\,m$

Altitude = 300 m

$\therefore$ base = $3 \times 300 = 900$ m

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

Question 3:

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

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

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

(i) Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

$$= \sqrt{48 \times 6 \times 14 \times 28}\ \text{cm}^2 = 336\ \text{cm}^2$$

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

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) cm = 72 cm
s = 36 cm
(s - a) = 18cm, (s - b) = 12 cm and (s - c) = 6 cm

(i) Area of triangle = $\sqrt{s(s-a)(s-b)(s-c)}$

$$= \sqrt{36 \times 18 \times 12 \times 6}\ \text{cm}^2 = 216\ \text{cm}^2$$

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

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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