Exercise 17A

Question 5:
On dividing 150 m in the ratio 5 : 12 : 13, we get

$$\text{Length of one side} = \left(150 \times \frac{5}{30}\right)\text{m} = 25\,\text{m}$$

$$\text{Length of the second side} = \left(150 \times \frac{12}{30}\right)\text{m} = 60\,\text{m}$$

$$\text{Length of third side} = \left(150 \times \frac{13}{30}\right)\text{m} = 65\text{m}$$

Let a = 25 m, b = 60 m, c = 65 m

$$\text{Then,} \quad s = \frac{1}{2}(25 + 60 + 65)\,\text{m} = 75\text{m}$$

(s - a) = 50 cm, (s - b) = 15 cm, and (s - c) = 10 cm

$$\text{Area of the triangle} = \sqrt{s(s-a)(s-b)(s-c)}$$
$$= \sqrt{75 \times 50 \times 15 \times 10}\ \text{m}^2$$
$$= 750\ \text{m}^2$$

Hence, area of the triangle = 750 m^2

Question 6:
On dividing 540 m in ratio 25 : 17 : 12, we get

$$\text{Length of one side} = \left(540 \times \frac{25}{54}\right)\text{m} = 250\text{m}$$

$$\text{Length of second side} = \left(540 \times \frac{17}{54}\right)\text{m} = 170\text{m}$$

$$\text{Length of third side} = \left(540 \times \frac{12}{54}\right)\text{m} = 120\,\text{m}$$

Let a = 250m, b = 170 m and c = 120 m

$$\text{Then,}\ s = \frac{1}{2}(250 + 170 + 120)\,\text{m} = 270\text{m}$$

Then, (s - a) = 29 m, (s - b) = 100 m, and (s - c) = 150m

$$\text{Area of the triangle} = \sqrt{s(s-a)(s-b)(s-c)}$$
$$= \sqrt{270 \times 29 \times 100 \times 150}\ m^2$$
$$= 9000\ m^2$$

The cost of ploughing 100 area is = Rs. 18. 80

The cost of ploughing 1 m^2 is = $\text{Rs.}\left(\frac{18.80}{100}\right)$

The cost of ploughing 9000 m^2 area = $\text{Rs.}\left(\frac{18.80}{100} \times 9000\right)$

= Rs. 1692

Hence, cost of ploughing = Rs 1692.

Question 7:
Let the length of one side be x cm
Then the length of other side = {40 × (17 + x)} cm = (23 - x) cm
Hypotenuse = 17 cm
Applying Pythagoras theorem, we get

$$\text{Then, } x^2 + (23-x)^2 = 17^2 \Rightarrow x^2 - 23x + 120 = 0$$
$$\Rightarrow (x-15)(x-8) = 0$$
$$\Rightarrow x = 15 \text{ or } x = 8$$
$$\text{Base} = 15 \text{ cm},$$
$$\text{height} = 40 - (17 + 15) = 40 - 32 = 8$$

$$\text{Area of triangle} = \frac{1}{2} \times \text{Base} \times \text{Height}$$
$$= \left(\frac{1}{2} \times 15 \times 8\right) cm^2 = 60\ cm^2$$

Hence, area of the triangle = 60 cm^2

Question 8:
Let the sides containing the right angle be x cm and (x × 7) cm

$$\text{Then, its area} = \left[\frac{1}{2} \times x \times (x-7)\right] cm^2$$

$$\text{But} \qquad \text{area} = 60\ cm^2$$
$$\therefore \frac{1}{2} \times (x-7) = 60$$
$$\Rightarrow x^2 - 7x - 120 = 0$$
$$\Rightarrow x^2 - 15x + 8x - 120 = 0$$
$$\Rightarrow x(x-15) + 8(x-15) = 0$$
$$\Rightarrow (x-15)(x+8) = 0$$
$$\Rightarrow \qquad x = 15 \left[\text{Neglecting } x = -8\right]$$

One side = 15 cm and other = (15 × 7) cm = 8 cm

$$\text{Hypotenuse} = \sqrt{(15)^2 + (8)^2}\ \text{cm} = \sqrt{225 + 64}\,\text{cm}$$

$$= \sqrt{289}\ \text{cm} = 17\ \text{cm}$$

perimeter of triangle (15 + 8 + 17) cm = 40 cm

********** END **********