Exercise 17A

Question 9:
Let the sides containing the right angle be x and (x × 2) cm

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

$$\text{But area} = 24 \text{ cm}^2$$

$$\therefore \frac{1}{2} x(x-2) = 24$$

$$\Rightarrow x^2 - 2x - 48 = 0$$

$$\Rightarrow x^2 - 8x + 6x - 48 = 0$$

$$\Rightarrow x(x-8) + 6(x-8) = 0$$

$$\Rightarrow (x-8)(x+6) = 0$$

$$x = 8 \text{ [Neglecting } x = -6\text{]}$$

One side = 8 cm, and other (8 × 2) cm = 6 cm
= 10 cm

$$\text{Hypotenuse} = \sqrt{(8)^2 + (6)^2} \text{ cm} = \sqrt{64+36} \text{ cm}$$

$$= \sqrt{100} \text{ cm}$$

Therefore, perimeter of the triangle = 8 + 6 + 10 = 24 cm

Question 10:

(i) Here a = 8 cm

Area of the triangle = $\left(\frac{\sqrt{3}}{4} \times a^2\right)$ sq. unit

$= \left(\frac{\sqrt{3}}{4} \times 8 \times 8\right) = \left(16\sqrt{3}\right) cm^2$

$= (16 \times 1.732)\ cm^2 = 27.71 cm^2$

(ii) Height of the triangle= $\left(\frac{\sqrt{3}}{2} \times a\right)$ units

$= \left(\frac{\sqrt{3}}{2} \times 8\right) cm = \left(4 \times \sqrt{3}\right) cm$

$= (4 \times 1.732) cm = 6.93\ cm$

Hence, area = 27.71 cm^2 and height = 6.93 cm

Question 11:
Let each side of the equilateral triangle be a cm

Then, its height = $\left(\frac{\sqrt{3}}{2} \times a\right) cm$

$\therefore \frac{\sqrt{3}}{2} \times a = 9 \Rightarrow a = \left(\frac{18}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}\right) = 6\sqrt{3}$

$\therefore$ Each side = a cm = $6\sqrt{3}$ cm

$\therefore$ Area of triangle = $\left(\frac{\sqrt{3}}{4} \times 6\sqrt{3} \times 6\sqrt{3}\right) cm^2 = \left(27\sqrt{3}\right) cm^2$

$= (27 \times 1.732) = 46.76\ cm^2$

Question 12:
Let each side of the equilateral triangle be a cm

Then, its area = $\left(\frac{\sqrt{3}}{4} a^2\right) cm$

$\therefore \frac{\sqrt{3}}{4} a^2 = 36\sqrt{3} \Rightarrow a^2 = \left(\frac{36\sqrt{3} \times 4}{\sqrt{3}}\right) = 144$

$a = \sqrt{144} = 12\ cm$

Perimeter of equilateral triangle = 3a = (3 × 12) cm = 36 cm

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