



### Exercise 7A

Question 11:

In an isosceles triangle, the lateral sides are of equal length.

Let the length of lateral side be  $x$  cm.

Then, base =  $\frac{3}{2} \times x$  cm [given]

(i) Length of each side of the triangle :

Perimeter of an isosceles triangle = 42 cm

$$\Rightarrow x + x + \frac{3}{2}x = 42 \text{ cm}$$

$$\Rightarrow 2x + 2x + 3x = 84 \text{ cm}$$

$$\Rightarrow 7x = 84$$

$$\Rightarrow x = \frac{84}{7} = 12 \text{ cm}$$

$\therefore$  length of lateral side = 12 cm

$$\text{And base} = \frac{3}{2}x = \frac{3}{2} \times 12 = 18 \text{ cm}$$

$\therefore$  the length of each side of the triangle = 12 cm, 12 cm and 18 cm.

(ii) Area of the triangle :

Let  $a = 12$  cm,  $b = 12$  cm and  $c = 18$  cm.

$$\begin{aligned} \text{Now, } s &= \frac{1}{2}(a + b + c) \\ &= \left( \frac{12 + 12 + 18}{2} \right) \text{ cm} = \left( \frac{42}{2} \right) \text{ cm} \\ &= 21 \text{ cm} \end{aligned}$$

$$\begin{aligned} \therefore \text{ area of the triangle} &= \sqrt{s(s-a)(s-b)(s-c)} \\ &= \sqrt{21(21-12)(21-12)(21-18)} \\ &= \sqrt{21 \times 9 \times 9 \times 3} \\ &= \sqrt{3 \times 7 \times 9 \times 9 \times 3} \\ &= 27\sqrt{7} = 71.42 \text{ cm}^2 \quad (\sqrt{7} = 2.64) \end{aligned}$$

$\therefore$  area of the triangle = 71.42 cm<sup>2</sup>.

(iii) Height of the triangle :

$$\text{Area of a triangle} = \frac{1}{2} \times \text{base} \times \text{height}$$

$$71.42 \text{ cm}^2 = \frac{1}{2} \times 18 \times h$$

$$\Rightarrow 71.42 \text{ cm}^2 = 9 \times h$$

$$\Rightarrow h = \frac{71.42}{9} = 7.94 \text{ cm}$$

$\therefore$  the height of the triangle = 7.94 cm.

\*\*\*\*\* END \*\*\*\*\*