

# Mathematics

(www.tiwariacademy.net)

(Chapter – 12) (Heron's Formula)(Exemplar Problems)

(Class – IX)

## Exercise 12.3

### Question 4:

The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3:2. Find the area of the triangle.

### Answer 4:

Let ABC be an isosceles triangle with perimeter 32cm.

We have ratio of equal side to its base is 3:2.

Let sides of a triangle be  $AB = AC = 3x$ ,  $BC = 2x$

$\therefore$  Perimeter of a triangle = 32m

Now,  $3x + 3x + 2x = 32$

$\Rightarrow 8x = 32$

$\Rightarrow x = 4$

$\therefore AB = AC = 3 \times 4 = 12$  cm

And  $BC = 2x = 2 \times 4 = 8$ cm

The sides of a triangle are  $a = 12$ cm,  $b = 12$ cm and  $c = 8$ cm

$\therefore s = \frac{a+b+c}{2} = \frac{12+12+8}{2} = \frac{32}{2} = 16$  cm

$\therefore$  Area of an isosceles  $\Delta ABC = \sqrt{s(s-a)(s-b)(s-c)}$  [by Heron's formula]

$$= \sqrt{16(16-12)(16-12)(16-8)}$$

$$= \sqrt{16 \times 4 \times 4 \times 8}$$

$$= 4 \times 4 \times 2\sqrt{2} \text{ cm}^2 = 32\sqrt{2} \text{ cm}^2$$

Hence, area of an isosceles triangle is  $32\sqrt{2} \text{ cm}^2$

