

Exercise VSAQs

Page No: 12.23

Question 1: Find the area of a triangle whose base and altitude are 5 cm and 4 cm respectively.

Solution:

Given: Base of a triangle = 5 cm and altitude = 4 cm

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

$$= \frac{1}{2} \times 5 \times 4$$

$$= 10$$

Area of triangle is 10 cm^2 .

Question 2: Find the area of a triangle whose sides are 3 cm, 4 cm and 5 cm respectively.

Solution:

Given: Sides of a triangle are 3 cm, 4 cm and 5 cm respectively

Apply Heron's Formula:

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

$$\text{Semi Perimeter, } s = \frac{(a+b+c)}{2}$$

Where, a, b and c are sides of a triangle

$$s = (3+4+5)/2 = 6$$

Semi perimeter is 6 cm

Now,

$$\text{Area} = \sqrt{6 \times (6-3) \times (6-4) \times (6-5)}$$

$$= \sqrt{6 \times 3 \times 2 \times 1}$$

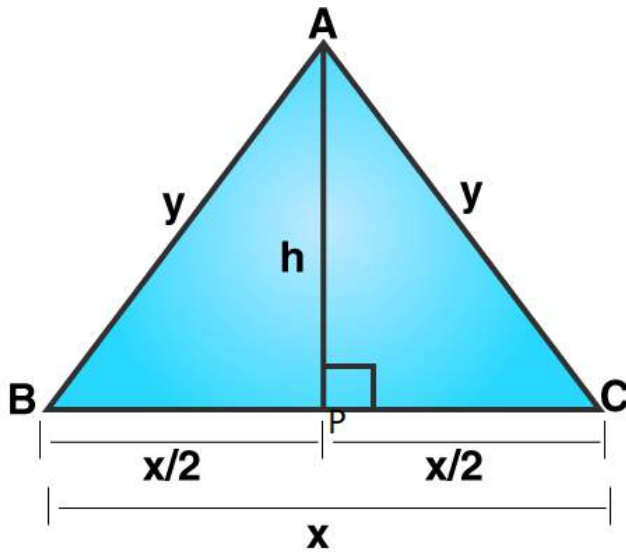
$$= \sqrt{36}$$

$$= 6$$

Area of given triangle is 6 cm^2 .

Question 3: Find the area of an isosceles triangle having the base x cm and one side y cm.

Solution:



In right triangle APC,

Using Pythagoras theorem,

$$AC^2 = AP^2 + PC^2$$

$$y^2 = h^2 + (x/2)^2$$

$$\text{or } h^2 = y^2 - (x/2)^2$$

$$\text{or } h = \sqrt{y^2 - x^2/4}$$

Now, Area = $1/2 \times$ Base \times Height

$$= 1/2 \times (\sqrt{y^2 - x^2/4})$$

$$= x/4 \sqrt{4y^2 - x^2}$$

Question 4: Find the area of an equilateral triangle having each side 4 cm.

Solution: Each side of an equilateral triangle = $a = 4$ cm

Formula for Area of an equilateral triangle = $(\sqrt{3}/4) \times a^2$

$$= (\sqrt{3}/4) \times 4^2$$

$$= 4\sqrt{3}$$

Area of an equilateral triangle is $4\sqrt{3}$ cm².

Question 5: Find the area of an equilateral triangle having each side x cm.

Solution:

Each side of an equilateral triangle = $a = x$ cm

Formula for Area of an equilateral triangle = $(\sqrt{3}/4) \times a^2$

$$= (\sqrt{3}/4) \times x^2$$

$$= x^2 \sqrt{3}/4$$

Area of an equilateral triangle is $\sqrt{3}x^2/4$ cm².