



Heron's Formula Ex 12.1 Q3

Answer :

Whenever we are given the measurement of all sides of a triangle, we basically look for Heron's formula to find out the area of the triangle.

If we denote area of the triangle by A , then the area of a triangle having sides a , b , c and s as semi-perimeter is given by;

$$A = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{Where, } s = \frac{a+b+c}{2}$$

We are given:

$$a = 18 \text{ cm}$$

$$b = 10 \text{ cm, and perimeter} = 42 \text{ cm}$$

$$\text{We know that perimeter} = 2s,$$

$$\text{So } 2s = 42$$

$$\text{Therefore } s = 21 \text{ cm}$$

$$\text{We know that } s = \frac{a+b+c}{2}, \text{ so}$$

$$21 = \frac{18+10+c}{2}$$

$$21 \times 2 = 28 + c$$

$$42 = 28 + c$$

$$c = 14 \text{ cm}$$

So the area of the triangle is:

$$A = \sqrt{21(21-18)(21-10)(21-14)}$$

$$A = \sqrt{21(3)(11)(7)}$$

$$A = \sqrt{4851}$$

$$\boxed{A = 21\sqrt{11} \text{ cm}^2}$$

Heron's Formula Ex 12.1 Q4

Answer :

Whenever we are given the measurement of all sides of a triangle, we basically look for Heron's formula to find out the area of the triangle.

If we denote area of the triangle by 'Area', then the area of a triangle having sides a , b , c and s as semi-perimeter is given by;

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

$$\text{Where, } s = \frac{a+b+c}{2}$$

We are given:

$$AB = 15 \text{ cm, BC} = 13 \text{ cm, AC} = 14 \text{ cm}$$

Here we will calculate s ,

$$s = \frac{AB+BC+AC}{2}$$

$$s = \frac{15+13+14}{2}$$

$$s = \frac{42}{2}$$

$$s = 21 \text{ cm}$$

So the area of the triangle is:

$$\text{Area} = \sqrt{21(21-15)(21-13)(21-14)}$$

$$\text{Area} = \sqrt{21(6)(8)(7)}$$

$$\text{Area} = \sqrt{7056}$$

$$\text{Area} = 84 \text{ cm}$$

$$\boxed{\text{Area} = 84 \text{ cm}^2}$$

Now draw the altitude from point B on AC which intersects it at point D. BD is the required altitude. So if you draw the figure, you will see,

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

$$= \frac{1}{2} \times AC \times BD$$

Here $AC = 14 \text{ cm}$ and $\text{Area of } \triangle ABC = 84 \text{ cm}^2$. So,

$$84 = \frac{1}{2} \times 14 \times BD$$

$$BD = \frac{84 \times 2}{14}$$

$$= 12 \text{ cm}$$

$$\boxed{BD = 12 \text{ cm}}$$

***** END *****