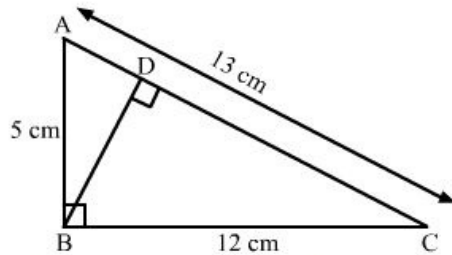




Triangles Ex 4.7 Q10

**Answer :**



Since  $BD \perp AC$  we obtained two right angled triangles,  $\triangle ABD$  and  $\triangle BDC$ .

In  $\triangle ABC$  and  $\triangle ABD$

$$\angle A = \angle A \quad (\text{Common angle})$$

$$\angle B = \angle D$$

So, by AA-criterion  $\triangle ABC \sim \triangle ADB$

$$\therefore \frac{AB}{AD} = \frac{BC}{BD} = \frac{AC}{AB}$$

$$\therefore \frac{BC}{BD} = \frac{AC}{AB}$$

Now we will multiply both sides of the equation by  $AB \times BD$ .

$$BC \times AB = BD \times AC \quad \dots\dots(1)$$

Let us simplify the equation (1) as given below,

$$BD = \frac{BC \times AB}{AC}$$

Now we will substitute the values of BC, AB and AC.

$$BD = \frac{12 \times 5}{13}$$

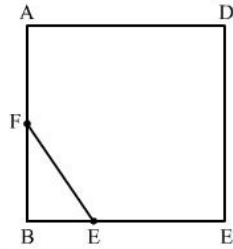
$$\therefore BD = \frac{60}{13}$$

$$\therefore BD = 4.6 \text{ cm}$$

Therefore, the length of the altitude is 4.6 cm.

Triangles Ex 4.7 Q11

Answer :



It is given that F is the midpoint of AB. Therefore, we have  $AF = FB$ .

It is also given that  $BE = \frac{1}{3} BC$  .....(1)

Now look at the figure. Quadrilateral ABCD is a square and hence all angles are of  $90^\circ$ .

In  $\triangle FBE$ ,  $\angle B = 90^\circ$  and hence it is a right angle triangle.

We know that the area of the right angle triangle is  $\frac{1}{2} \times \text{base} \times \text{height}$

$$\text{Therefore, } Ar(\triangle FBE) = \frac{1}{2} \times BF \times BE \\ = 108 \text{ cm}^2$$

Now we will multiple both sides of the equation by 2 we get,  $BF \times BE = 216$  .....(2)

But we know that and  $BE = \frac{1}{3} BC$ .

Let us substitute these values in equation (2) we get,

$$\frac{1}{2} \times AB \times \frac{1}{3} \times BC = 216$$

Let us simplify the above equation as below,

$$AB \times BC = 6 \times 216$$

But we know that ABCD is a square and hence  $AB = BC = CD = AD$ .

$$\therefore AB^2 = 6 \times 216 \quad \text{.....(3)}$$

We know that 216 is the cube of 6 therefore we can write the equation (3) as below,

$$AB^2 = 6^3 \times 6$$

$$AB^2 = 6^4$$

$$\therefore AB = 6^2 = 36$$

Therefore, side of the square ABCD is 36 cm.

Now we are going to find the diagonal AC.

Diagonal of the square can be calculate by using the formula given below,

$$\text{Diagonal} = \sqrt{2} \text{ Side}$$

$$AC = \sqrt{2} \times 36 \quad \text{.....(4)}$$

We know that  $\sqrt{2} = 1.414$

Let us substitute the value of  $\sqrt{2}$  in equation (3).

$$AC = 1.414 \times 36$$

$$= 50.904$$

Therefore, the length of AC is 50.904 cm.

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