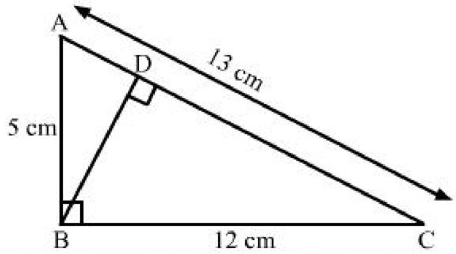
Triangles Ex 4.7 Q10

Answer :



Since $BD \perp AC$ we obtained two right angled triangles, ΔABD and ΔBDC.

In ΔABC and ΔABD

$\angle A = \angle A$ (Common angle)

$\angle B = \angle D$

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

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

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

$BC \times AB = BD \times AC$ .....(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.

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

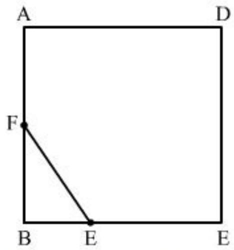
$$\therefore BD = \frac{60}{13}$$

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

Therefore, the length of the altitude is $\boxed{4.6 \text{ cm}}$.

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°.

In ΔFBE , $\angle B = 90°$ and hence it is a right angle triangle.

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

Therefore, $Ar(\Delta FBE) = \frac{1}{2} \times BF \times BE$

$= 108$ 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.

$\therefore AB^2 = 6 \times 216$ .....(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,

Diagonal = $\sqrt{2}$ Side

$AC = \sqrt{2} \times 36$ .....(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 $\boxed{50.904 \text{ cm}}$.

*********** END **********