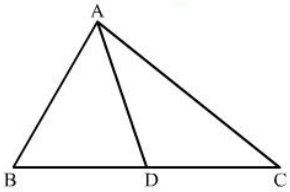
Triangles Ex 4.7 Q16

Answer :

Let ΔABC be acute angled triangle where AD is its median with respect side BC.



It is known that in any triangle, the sum of the squares of any two sides is equal to twice the square of half of the third side together with twice the square of the median which bisects the third side.

$$\therefore AB^2 + AC^2 = 2AD^2 + 2\left(\frac{1}{2}BC\right)^2$$

$$AB^2 + AC^2 = 2AD^2 + \frac{1}{2}BC^2$$

$$AD^2 = \frac{2AB^2 + 2AC^2 - BC^2}{4}$$

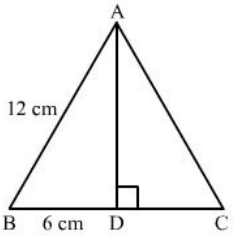
This is the required expression.

Triangles Ex 4.7 Q17

Answer :

We are asked to find the height of the equilateral triangle.

Let us draw the figure. Let us draw the altitude AD. We know that altitude is also median of the equilateral triangle.



Therefore, $BD = DC = 6\text{ cm}$.

In right angled triangle ADB, we will Pythagoras theorem, as shown below,

$AB^2 = AD^2 + BD^2$

Now we will substitute the values.

$12^2 = AD^2 + 6^2$

$144 = AD^2 + 36$

$AD^2 = 144 - 36 = 108$

Taking square root, we get

$AD = 10.39$ cm

Therefore, the height of the equilateral triangle is $\boxed{10.39\text{ cm}}$.

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