Question 5. The altitude of right triangle is 7 cm less than its base. If, hypotenuse is 13 cm. Find the other two sides.

Solution :

Let base of triangle be $x\ cm$

Let altitude of triangle be $(x-7)$ cm

It is given that hypotenuse of triangle is 13 cm

According to Pythagoras Theorem, we can say that

$13^2 = x^2 + (x-7)^2$ $\qquad\qquad (a+b)^2 = a^2 + b^2 + 2ab$

$\Rightarrow 169 = x^2 + x^2 + 49 - 14x$

$\Rightarrow 169 = 2x^2 - 14x + 49$

$\Rightarrow 2x^2 - 14x - 120 = 0$

Dividing equation by 2, we get

$x^2 - 7x - 60 = 0$

$\Rightarrow x^2 - 12x + 5x - 60 = 0$

$\Rightarrow x(x-12) + 5(x-12) = 0$

$\Rightarrow (x-12)(x+5)$

$\Rightarrow x = -5, 12$

We discard x=-5 because length of side of triangle cannot be negative.

Therefore, base of triangle $= 12\ cm$

Altitude of triangle $= (x-7) = 12 - 7 = 5\ cm$

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