

Ncert Solutions Chapter 4 Quadratic Equations Exercise 4.2 Question 5

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

$$\begin{aligned}13^2 &= x^2 + (x - 7)^2 & (a + b)^2 &= a^2 + b^2 + 2ab \\ \Rightarrow 169 &= x^2 + x^2 + 49 - 14x \\ \Rightarrow 169 &= 2x^2 - 14x + 49 \\ \Rightarrow 2x^2 - 14x - 120 &= 0\end{aligned}$$

Dividing equation by 2, we get

$$\begin{aligned}x^2 - 7x - 60 &= 0 \\ \Rightarrow x^2 - 12x + 5x - 60 &= 0 \\ \Rightarrow x(x - 12) + 5(x - 12) &= 0 \\ \Rightarrow (x - 12)(x + 5) \\ \Rightarrow x &= -5, 12\end{aligned}$$

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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