# Ncert Solutions Chapter 4 Quadratic Equations Exercise 4.3 Question 6

**Question 6**. The diagonal of a rectangular field is 60 metres more than the shorter side. If, the longer side is 30 metres more than the shorter side, find the sides of the field.

**Solution** :

Let shorter side of rectangle $= x$ *metres*

Let diagonal of rectangle $= x + 60$ *metres*

Let longer side of rectangle $= x + 30$ *metres*

According to Pythagoras theorem, we can say that

$$(x + 60)^2 = (x + 30)^2 + x^2$$
$$\Rightarrow x^2 + 3600 + 120x = x^2 + 900 + 60x + x^2$$
$$\Rightarrow x^2 - 60x - 2700 = 0$$

Comparing equation $x^2 - 60x - 2700 = 0$ with standard form $ax^2 + bx + c = 0,$ *we get*

$a = 1, b = -60$ *and* $c = -2700$

Applying quadratic formula $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a},$ *we get*

$$x = \dfrac{60 \pm \sqrt{(-60)^2 - 4(1)(-2700)}}{2}$$

$$\Rightarrow x = \dfrac{60 \pm \sqrt{3600 + 10800}}{2} = \dfrac{60 \pm \sqrt{14400}}{2} = \dfrac{60 \pm 120}{2}$$

$$\Rightarrow x = \dfrac{60 + 120}{2}, \dfrac{60 - 120}{2}$$

$$\Rightarrow x = \dfrac{180}{2}, \dfrac{-60}{2} = 90, -30$$

Length cannot be in negative. Therefore, we ignore $-30$.

Therefore $x = 90$ which means length of shorter side $= 90$ metres and length of longer side $= x + 30 = 90 + 30 = 120$ metres

Therefore, length of sides are **90** and **120** in **metres**.

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