

## Ncert Solutions Chapter 4 Quadratic Equations Exercise 4.3 Question 5

**Question 5.** In a class test, the sum of Shefali's marks in Mathematics and English is 30. Had she got 2 marks more in Mathematics and 3 marks less in English, the product of their marks would have been 210. Find her marks in the two subjects.

**Solution :**

Let Shefali's marks in Mathematics =  $x$

Let Shefali's marks in English =  $30 - x$

If, she had got 2 marks more in Mathematics, her marks would be =  $x + 2$

If, she had got 3 marks less in English, her marks in English would be =  $30 - x - 3 = 27 - x$

According to given condition :

$$(x + 2)(27 - x) = 210$$

$$\Rightarrow 27x - x^2 + 54 - 2x = 210$$

$$\Rightarrow x^2 - 25x + 156 = 0$$

Comparing quadratic equation  $x^2 - 25x + 156 = 0$  with general form  $ax^2 + bx + c = 0$ , we get  $a = 1, b = -25$  and  $c = 156$

Applying Quadratic Formula  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ , we get

$$x = \frac{25 \pm \sqrt{(-25)^2 - 4(1)(156)}}{2}$$

$$\Rightarrow x = \frac{25 \pm \sqrt{625 - 624}}{2} = \frac{25 \pm 1}{2}$$

$$\Rightarrow x = \frac{25 + 1}{2}, \frac{25 - 1}{2}$$

$$\Rightarrow x = 13, 12$$

Therefore, Shefali's marks in Mathematics = 13 or 12

Shefali's marks in English =  $30 - x = 30 - 13 = 17$

Or

Shefali's marks in English =  $30 - x = 30 - 12 = 18$

Therefore her marks in Mathematics and English are (13, 17) or (12, 18).

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