Quadratic-Equations

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10^{th} Maths - Chapter 4

This is Problem-3 from Exercise 4.2

1. Find two numbers whose sum is 27 and produict is 182

Solution:
let the first number be x, therefore the second will be $27 - x$
Given:

$$x(27 - x) = 182 \tag{1}$$
$$\implies 27x - x^2 = 182 \tag{2}$$
$$\implies x^2 - 27x + 182 = 0 \tag{3}$$

Using formula method,first solution is:

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \tag{4}$$
$$= \frac{-(-27) + \sqrt{(-27)^2 - 4(1)(182)}}{2(1)} \tag{5}$$
$$= \frac{27 + \sqrt{729 - 728}}{2} \tag{6}$$
$$= \frac{27 + \sqrt{1}}{2} \tag{7}$$
$$= \frac{27 + 1}{2} \tag{8}$$
$$= \frac{28}{2} = 14 \tag{9}$$

the second solution is:

$$x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a} \tag{10}$$
$$= \frac{-(-27) - \sqrt{1}}{2} \tag{11}$$
$$= \frac{27 - \sqrt{1}}{2} \tag{12}$$
$$= \frac{26}{2} = 13 \tag{13}$$