

QUADRATIC EQUATIONS

Pranav(venkatapranavkoushik.malla@sriprakashschools.com)

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10th Maths - Chapter 4

This is Problem-2.1 from Exercise 4.2

1. Rohan's mother is 26 years older than him. The product of their ages (in years) 3 years from now will be 360. We would like to find Rohan's present age.

Solution: : Rohan age = x

His mother's age = $(x + 26)$

After three years

Rohan's age = $(x + 3)$

His mother's age = $(x + 29)$

$$(x + 3)(x + 29) = 360$$

$$x^2 + 29x + 3x + 87 = 360$$

$$x^2 + 32x - 273 = 0$$

Using the formula for the quadratic equation

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (1)$$

Substituting

$$a = 1, b = 32, c = -273 \quad (2)$$

$$(3)$$

$$x_1 = \frac{-32 + \sqrt{32^2 - 4 \times 1 \times 273}}{2 \times 1} \quad (4)$$

$$= \frac{32 + \sqrt{1024 + 1092}}{2} \quad (5)$$

$$= \frac{32 + \sqrt{2116}}{2} \quad (6)$$

$$= \frac{-32 + 46}{2} \quad (7)$$

$$= \frac{14}{2} \quad (8)$$

$$= 7 \quad (9)$$