

Solving Quadratic Equation

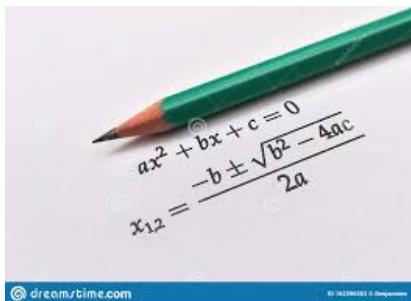
Name

DU

01-04-2022

Solution of the following equation :-

$$ax^2 + bx + c = 0$$



A photograph showing a green pencil resting diagonally on a white surface. Handwritten on the surface is the quadratic equation $ax^2 + bx + c = 0$ and its solution, the quadratic formula: $x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. The text is written in black ink. At the bottom of the image, there is a blue banner with the text "dreamstime.com" on the left and "10 1622046283 © dreamstime" on the right.

Figure: Quadratic Equation Solution

- * Divide all terms by a so as to reduce the coefficient of x^2 to

$$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$$

- * Subtract the constant term from both sides of the equation

$$x^2 + \frac{b}{a}x = -\frac{c}{a}$$

- * To have a square on the left side the third term (constant) should be $(\frac{b}{2a})^2$

- * So add that amount to both sides

$$x^2 + \frac{b}{a}x + (\frac{b}{2a})^2 = (\frac{b}{2a})^2 - \frac{c}{a}$$

* Take the square root of both sides (remembering that the result could be plus or minus)

$$x + \frac{b}{2a} = \pm \left(\sqrt{\left(\frac{b}{2a}\right)^2 - \frac{c}{a}} \right)$$

* with some simplification

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

THANKS