

UEB: Example of Mathematics Notation (with UK Maths Code Version for Comparison)

Print version:

Deriving the Quadratic Formula:

This is the original equation.

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

Move the loose number to the other side.

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

Divide through by whatever is multiplied on the squared term.

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

Take half of the x -term, and square it.

$$\frac{b^2}{4a^2}$$

Add the squared term to both sides.

$$x^2 + \frac{bx}{a} + \frac{b^2}{4a^2} = \frac{-c}{a} + \frac{b^2}{4a^2}$$

Simplify on the right-hand side; in this case, simplify by converting to a common denominator.

$$x^2 + \frac{bx}{a} + \frac{b^2}{4a^2} = \frac{-4ac}{4a^2} + \frac{b^2}{4a^2}$$

$$\therefore \dots = \frac{b^2 - 4ac}{4a^2}$$

Convert the left-hand side to square form.

$$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$$

Square-root both sides, remembering to put the “ \pm ” on the right.

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

Solve for “ x ”, and simplify as necessary.

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

[Taken from <http://www.purplemath.com/modules/sqrquad2.htm>]