



QUADRATIC EQUATION SOLUTIONS

Why

Given a, b, c , find x to solve $ax^2 + bx + c = 0$.

Result

Proposition 1. *Let $a, b, c \in \mathbf{R}$. Then both*

$$\frac{-b + \sqrt{b^2 - 4ac}}{2a} \text{ and } \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

are solutions of

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

We call $ax^2 + bx + c = 0$ a *quadratic equation*.¹

The solutions are often written in short hand

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

which is called the *quadratic formula*.

¹Future editions will prove via completing the square.

