



## 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*.<sup>1</sup>

The solutions are often written in short hand

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

which is called the *quadratic formula*.

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<sup>1</sup>Future editions will prove via completing the square.



