0.1 Solving quadratic polynomials

0.1.1 Quadratic polynomials

Quadratic polynomials are of the form $ax^2 + bx + c = 0$.

0.1.2 Solving quadratic polynomials

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

0.1.3 Proof

We can get the two solutions to a quadratic equation from the following manipulation.

$ax^2 + bx + c = 0$

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

$a[(x + \frac{b}{2a})^2 - \frac{b^2}{4a^2}] = -c$

$a[(x + \frac{b}{2a})^2] = \frac{b^2}{4a} - c$

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

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

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