

Quadratic equations

The quadratic equation

$$ax^2 + bx + c = 0, \tag{1}$$

where a, b and c are constants and $a \neq 0$, has two solutions for the variable x :

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}. \tag{2}$$

If the *discriminant* Δ with

$$\Delta = b^2 - 4ac$$

is zero, then the equation (1) has a double solution: (2) becomes

$$x = -\frac{b}{2a}.$$