Algebra

cytopyge

1. Polynomials

1.1. Second degree, quadratic equation

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

with:

$$a \neq 0$$

1.1.1. Roots

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

Two solutions, unequal roots

$$\Delta > 0: \qquad x_{1,2} = \frac{-b \pm \sqrt{\Delta}}{2a}$$

One solution, equal roots

$$\Delta = 0: \qquad x = \frac{-b}{2a}$$

No solution or two complex roots

$$\Delta < 0: \qquad x \notin R$$

1.1.2. Completing the square

$$x^2 + px = x^2 + px + (\frac{p}{2})^2 - (\frac{p}{2})^2 = (x + \frac{p}{2})^2 - (\frac{p}{2})^2$$