QUADRATIC FORMULA

Quadratic Formula provides solutions to a quadratic equation, i.e. provides values for the zeros of a quadratic function.

\[ f(x) = ax^2 + bx + c = 0 \]

\[ x_1 = \frac{-b - \sqrt{b^2 - 4ac}}{2a} \]
\[ x_2 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \]

Let’s introduce a symbol \( \Delta \) (read: delta) to denote a discriminant \( \Delta = b^2 - 4ac \) It determines the number of real solutions of a quadratic equation.

\( \Delta < 0 \)

No real solutions.
\( X_1 \) and \( X_2 \) are complex numbers (non-real).

\( \Delta = 0 \)

One real solution.
\( X_1 = X_2 \) is a real number.

\( \Delta > 0 \)

Two real solutions.
\( X_1 \neq X_2 \) are real numbers.

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