Awesome LaTeX

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In elementary algebra, the quadratic formula is the solution of the quadratic equation. There are other ways to solve the quadratic equation instead of using the quadratic formula, such as factoring, completing the square, or graphing. Using the quadratic formula is often the most convenient way.

The general quadratic equation is

$ax^2 + bx + c = 0$.

Here x represents an unknown, while a, b, and c are constants with a not equal to 0. One can verify that the quadratic formula satisfies the quadratic equation, by inserting the former into the latter. With the above parameterization, the quadratic formula is:

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

Each of the solutions given by the quadratic formula is called a root of the quadratic equation. Geometrically, these roots represent the x values at which any parabola, explicitly given as $y = ax^2 + bx + c$, crosses the x-axis. As well as being a formula that will yield the zeros of any parabola, the quadratic equation will give the axis of symmetry of the parabola, and it can be used to immediately determine how many zeros it has.

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

Let's see what this does.

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