

Derivation of the Quadratic Equation

finiteautomata4

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1 For laurakh94

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

where $a, b, c,$ and $x \in \mathbb{C}$ $x^2 + \frac{b}{a}x + \frac{c}{a} = 0$ divide by a $x^2 + \frac{b}{a}x = -\frac{c}{a}$ subtract $x^2 + \frac{b}{a}x + \frac{c}{a} = -\frac{c}{a}$ substitute in $(x + \frac{b}{2a})^2 -$

2 Conclusion

Straightforward, but unfortunately unlikely for a student of the US educational system to have learned, much less memorized (and without insight into the substitution step, nontrivial to a nonmathematician).

The general solution of the cubic was one of the central mysteries of mathematics up until the late 1500s. Subsequently, the discovery of the unsolvability of the quintic

$ax^5 + bx^4 + c \dots$ in the rational or irrational numbers led to the (simultaneous) creation of the complex numbers

code available at <https://github.com/NotBrianZach/proofs>