

The quadratic formula: a dissertation.

In junior high or high school algebra, we learn that the solutions of the quadratic equation $ax^2 + bx + c = 0$ are given by the formula

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

The bane of novice math students everywhere, the quadratic formula is nevertheless essential for modern life, constituting the basis for such diverse everyday technology as slinkies, deviled eggs and welcome mats.

What is less known is that the quadratic formula also plays an essential role in the arts. Classical composers such as Bach would often begin with an arbitrary mathematical function like $f(x) = e^{e^{x+20}}$ and by inputting it into the quadratic formula or vice versa repeatedly, generate sophisticated fugues and occasionally even entire operas. Jackson Pollack once remarked when asked about the importance of the quadratic formula in his own paintings that

$$\gamma_1 = 1, \gamma_2 = 1, \gamma_{n+1} = \gamma_n + \gamma_{n-1}.$$

Which if you think about it clarifies a lot about his work.

In conjunction with the calculus, even politics has been heavily influenced by the quadratic formula. Henry Kissinger claims that the Nixon China policy was inspired by solutions to the quadratic equation with coefficients $a = 1$, $b = \int_5^\infty e^{-x} \sin x dx$ and $c = \frac{d}{dx}(10x - 4)$.