Project Assignment

Module: Math

Title: The Quadratic Formula

Description:

Why spend your life factoring when you can just get the answer from a formula? - that's what my 6th grade self asked!   The quadratic formula seemed like magic to me then, automatically producing the roots of a quadratic equation:

Given:

$$a\,x^2 \; + \; b\,x \; + \; c \; = \; 0$$

Then:

$$x_{(1,2)} \; = \; \frac{-b \; \pm \; \sqrt{b^2 - 4\,ac}}{2\,a}$$

Sadly, there was a trick to it - the quadratic equation does not always produce real numbers! It depends on the value of the horrible "discriminant". That's the part under the square root sign. If b^2 - 4ac is:

- **positive**, then x1 and x2 are two distinct real number solutions

- **zero** then x1 and x2 are the same.

- **negative**, then neither of the solutions are real numbers. (We would learn about imaginary numbers in 7th grade.)

Instructions:

Write a program that accepts three real numbers representing a, b, and c. Print out the real root (or roots) of the equation, if they exist. If there are no real roots, let the user know.

Bonus:

We'll talk about complex and imaginary types later.