

Solving Quadratic Equations Using the Quadratic Formula

The *quadratic formula* is a formula for determining the roots of a quadratic equation in the form $ax^2 + bx + c = 0$, where $a \neq 0$. The derivation of this formula will be taught in Pre-Calculus 110.

Quadratic Formula

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

Example 1:

Determine the *exact* roots of the following quadratic equations using the quadratic formula:

a. $6x^2 - 3 = 7x$

b. $2x^2 + 8x - 5 = 0$

Example 2:

Suppose a pebble were to fall from a 200 m cliff to the water below. The height of the stone above the water, $h(t)$, in metres, after t seconds can be represented by the function

$h(t) = -4.9t^2 + 3t + 200$. How long, to the nearest tenth of a second, would the stone take to reach the water?

Note: An **inadmissible solution** is a solution to an equation that does not make sense in the context of the original problem.