4.4 The Quadratic Formula

Discriminant:

-the discriminant is part of the quadratic formula used to determine the number of solutions in a quadratic equation in the form:

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

Discriminant: $b^2 - 4ac$

There are three cases:

$b^2 - 4ac < 0$ ➔ There are no real roots

$b^2 - 4ac = 0$➔ There is one distinct real root

$b^2 - 4ac > 0$➔ The re are two different real roots

Example 1: Use the discriminant to determine the nature of the roots (0, 1 or 2)

a.) $x^2 - 5x + 4 = 0$

b.) $3x^2 + 4x + \frac{4}{3} = 0$

c.) $2x^2 - 8x = -9$

Quadratic Formula:

-used to determine the roots of a quadratic equation in the form

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

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

Example 2: Use the quadratic formula to solve to the nearest hundreths

a.) $9x^2 + 12x = -4$

b.) $5x^2 - 7x - 1 = 0$

c.) $3x^2 + 5x - 2 = 0$

d.) $\frac{x^2}{2} - x - \frac{5}{2} = 0$