Sec 5-8: The Quadratic Formula Equation must be written in the following form:

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

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

A Quadratic Equation always has two real solutions if:

b² - 4ac is positive

b² - 4ac will ALWAYS be positive if:

Either a OR c is negative.

Discriminant	# and kind of solutions
b ² - 4ac > 0	2 Real Solutions
b ² - 4ac = 0	1 Real Solution
b ² - 4ac < 0	0 Real Solutions or 2 Imaginary Solutions

How many x-intercepts does each Quadratic Function have?

This is the same as asking how many solutions or how many zeros does it have

1.
$$y = 4x^2 - 6x + 3$$

2.
$$y = -3x^2 + 15x + 19$$

$$b^{2} - 4ac = 36 - 4(4)(3)$$

$$36 - 48 = -12$$

No Real Solution means No x-intercepts Since a is negative and c is positive there will be Two Real Solutions.

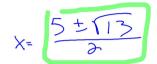
Therefore, there are Two x-intercepts

$$x^2 + 3 = 5x$$

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

Standard Form first

$$b^2 - 4ac = 3$$
 2 Real Solutions



since you can't simplify the square root there is nothing left to do.

Find the EXACT Solutions.

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

$$4x^2 - 24x + 31 = 0$$

$$b^2 - 4ac = 90$$
 2 Real Solutions

reduce using the GCF of 4

Find the EXACT Solutions.

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

$$x^2 - 8x - 2 = 0$$

$$b^2 - 4ac = 72$$
 2 Real Solutions

$$X = \begin{cases} 8 \pm \sqrt{72} - \sqrt{36-2} & = 8 \pm 6\sqrt{2} \\ 2 & = 3\sqrt{2} \end{cases}$$
Divide 8 and 6
$$4 \pm \sqrt{3}\sqrt{2}$$
by 2.

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

$$4x^2 - 12x + 9 = 0$$

$$b^2 - 4ac = \bigcirc$$
 One Real Solution

$$X = \frac{-b \pm 10}{2a} = \frac{-b}{2a} = \frac{12}{8} = \frac{3}{2}$$