The Discriminant

Name _____

Date _____ Period _____

Zeros of a Quadratic Function

are values of x such that $f(x) = 0$

Given Quadratic Function

$$f(x) = ax^2 + bx + c$$

Create Quadratic Equation

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

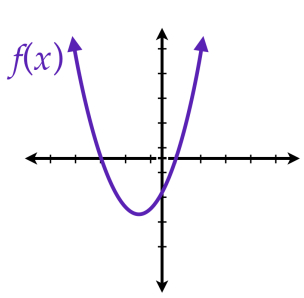
$a = ?$ $b = ?$ $c = ?$

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

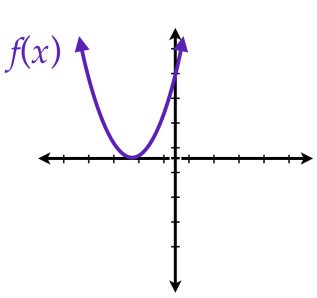
Zeros of a Quadratic Function

are values of x such that $f(x) = 0$

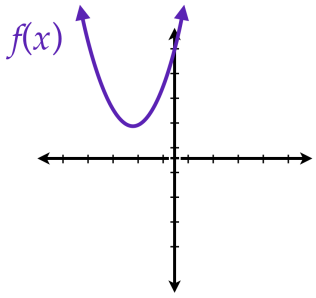
If $b^2 - 4ac > 0$



If $b^2 - 4ac = 0$



If $b^2 - 4ac < 0$



Determine the type and number of zeros for the following functions.

$f(x) = x^2 + 2x - 8$ $f(x) = 2x^2 - 5x + 6$

$b^2 - 4ac > 0$
two real zeros
two x-intercepts

$b^2 - 4ac = 0$
one real zero
one x-intercept

$b^2 - 4ac < 0$
two non-real zeros
no x-intercepts

Determine the type and number of zeros for the following functions.

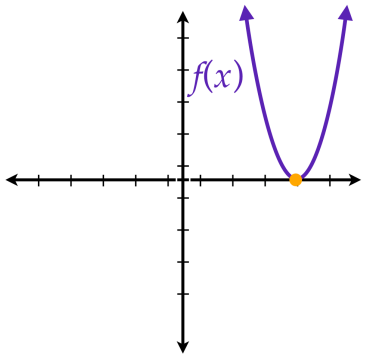
$f(x) = x^2 + 6x + 9$ $f(x) = 4x^2 + 2x + 9$

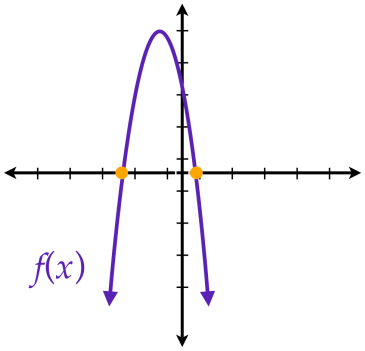
$b^2 - 4ac > 0$
two real zeros
two x-intercepts

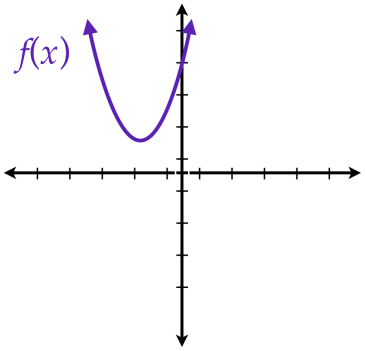
$b^2 - 4ac = 0$
one real zero
one x-intercept

$b^2 - 4ac < 0$
two non-real zeros
no x-intercepts

Given the following graphs, tell whether the discriminant is positive, negative or zero.







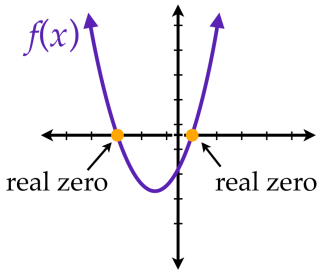
Zeros of a Quadratic Function

are values of x such that $f(x) = 0$

If $b^2 - 4ac > 0$

$f(x)$ has two real zeros

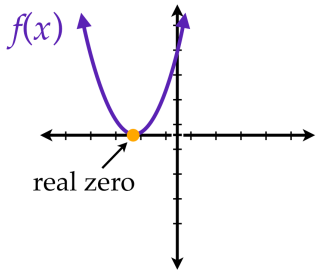
$f(x)$ has two x-intercepts



If $b^2 - 4ac = 0$

$f(x)$ has one real zero

$f(x)$ has one x-intercept



If $b^2 - 4ac < 0$

$f(x)$ has two non-real zeros

$f(x)$ has no x-intercepts