Chapter 4 - Quadratic Equations

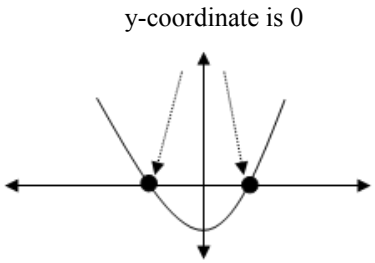
4.1 Graphical Solutions of Quadratic Equations

Quadratic Equation and a ***Quadratic Function*** .

Quadratic Function: $y = ax^2 + bx + c$, $a \neq 0$

Quadratic Equation: $0 = ax^2 + bx + c$, $a \neq 0$

A quadratic function gives all of the points of the parabola when we sketch it whereas, a quadratic equation is a special case of the function, in this case when $y = 0$ (in other words, the x-intercepts of the graph of the function).



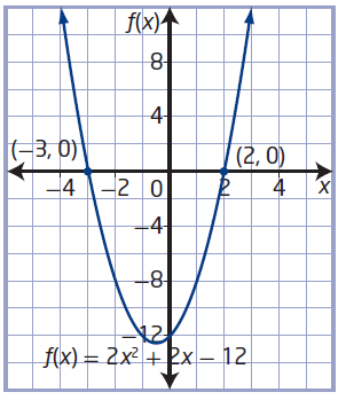
The **X-INTERCEPTS** of the *graph* of a function is the same as the **ROOTS** of the *equation* or the **ZEROS** of a *function.*

We could be asked to find the ***roots*** of the equation $x^2 - 7x + 12 = 0$, to find the ***zeros*** of the function $f(x) = x^2 - 7x + 12$, or to determine the ***x-intercepts*** of $y = x^2 - 7x + 12$.

In each case, we would arrive at the same solution $x = 3$ or $x = 4$.

Ex. Solve by graphing

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

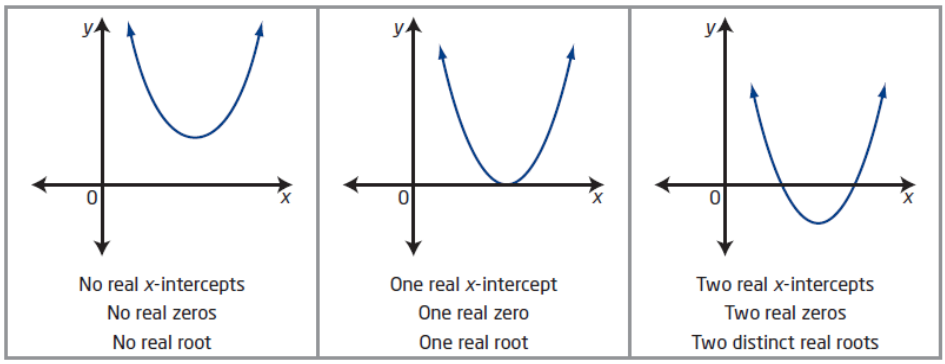


Example 1

Quadratic Equations With One Real Root

What are the roots of the equation $-x^2 + 8x - 16 = 0$?

The graph of a quadratic function can have zero, one, or two real x-intercepts. Therefore, the quadratic function has zero, one, or two real zeros, and correspondingly the quadratic equation has zero, one, or two real roots.



Key Ideas p. 214

Assign p. 215-217 #'s 1,2,3(ad),17,18