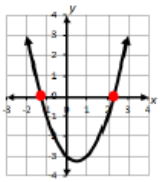
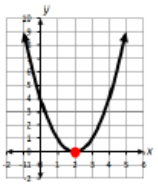
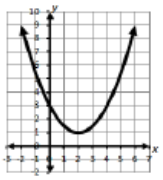
Quadratic Equation

(Number/Type of Solutions)

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

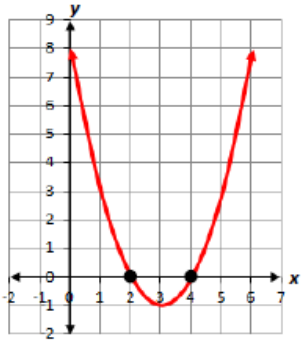
Examples	Graph of the related function	Number and Type of Solutions/Roots
$x^2 - x = 3$		**2 distinct Real roots** (crosses *x*-axis twice)
$x^2 + 16 = 8x$		**1 distinct Real root with a multiplicity of two (double root)** (touches *x*-axis but does not cross)
$\frac{1}{2}x^2 - 2x + 3 = 0$		**0 Real roots; 2 Complex roots**

Quadratic Equation

$ax^2 + bx + c = 0$

$a \neq 0$

Example: $x^2 - 6x + 8 = 0$

Solve by factoring	Solve by graphing
$x^2 - 6x + 8 = 0$ $(x - 2)(x - 4) = 0$ $(x - 2) = 0$ or $(x - 4) = 0$ $x = 2$ or $x = 4$	Graph the related function $f(x) = x^2 - 6x + 8$. 

Solutions (roots) to the equation are 2 and 4; the x-coordinates where the function crosses the x-axis.