<u>10.3: Solve Quadratic Equations by Graphing</u>

Goals: *Identify solutions to a quadratic equation by graphing
*Approximate solutions of a quadratic equation to the nearest tenth

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RECALL

A **<u>quadratic equation</u>** is:

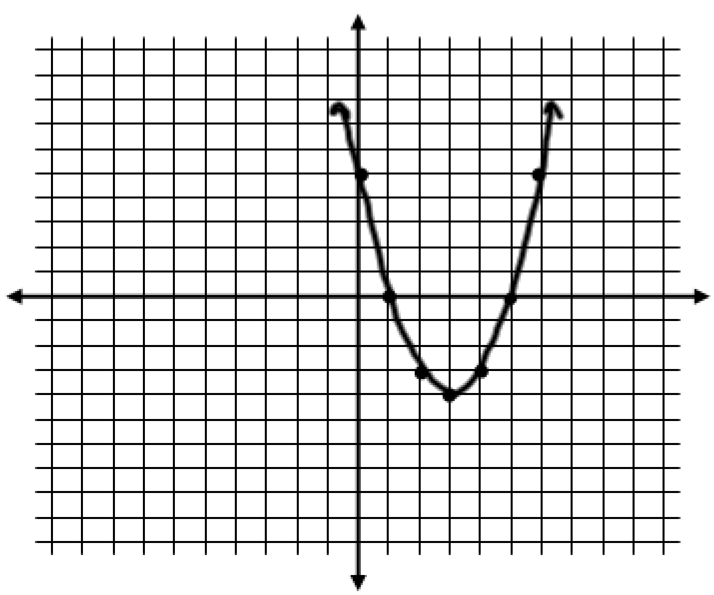
A **<u>solution</u>** to a quadratic equation can also be called a:

<u>Solutions</u> or ________________ are the values of x so the quadratic equation is equal to:

**We already know how to solve a quadratic equation by:

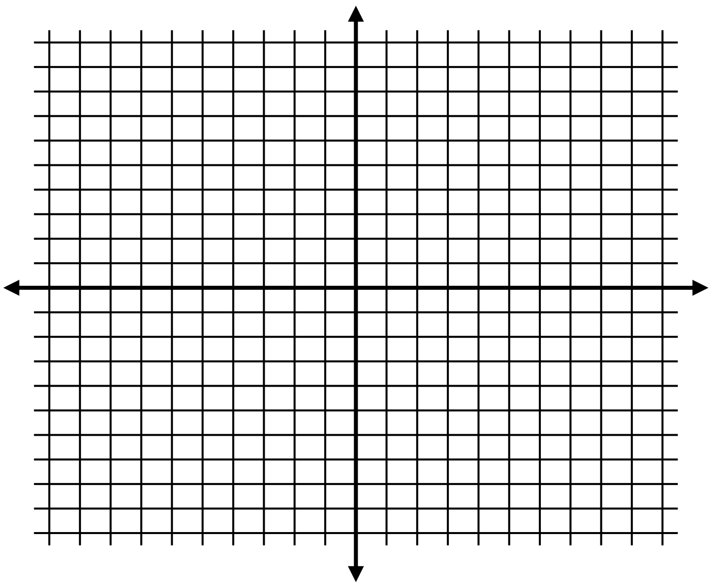
Since we know that solutions occur when $y = 0$, how can you identify solutions on a graph then?

Ex: The graph below models the parabola formed by the quadratic equation $y = x^2 - 6x + 5$. What do you think the solutions are? Why?

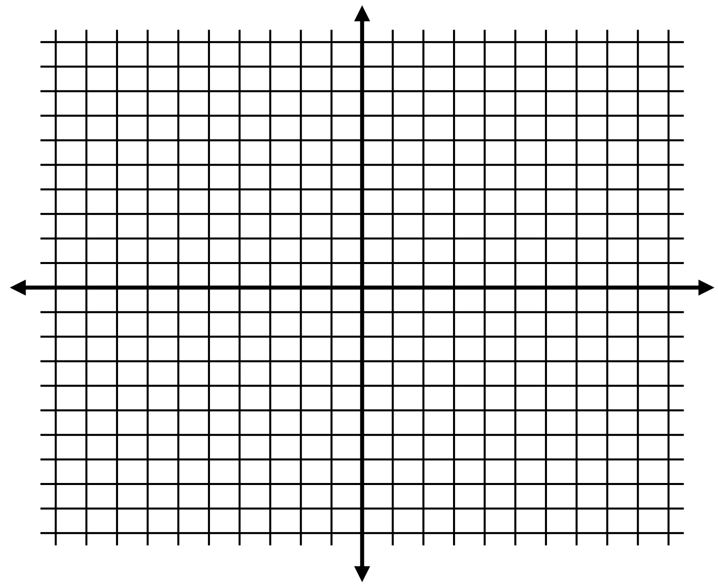


Solve the following quadratic equations by graphing:

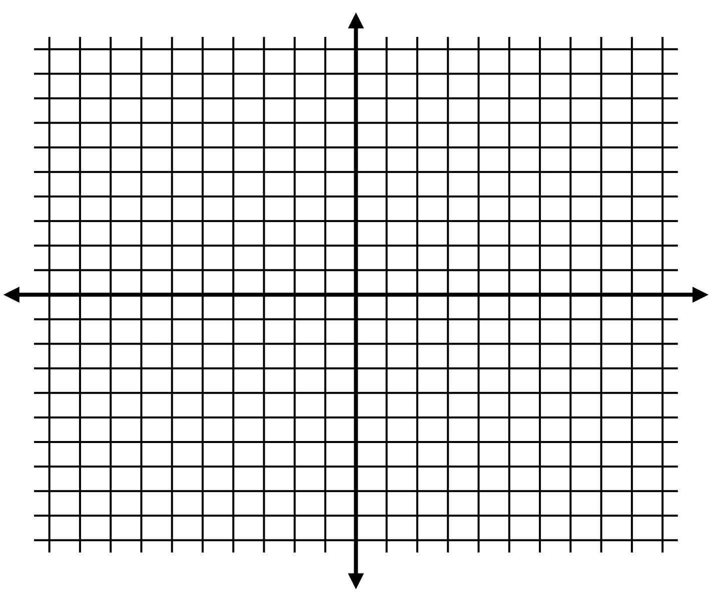
Ex: $x^2 - 2x = 3$



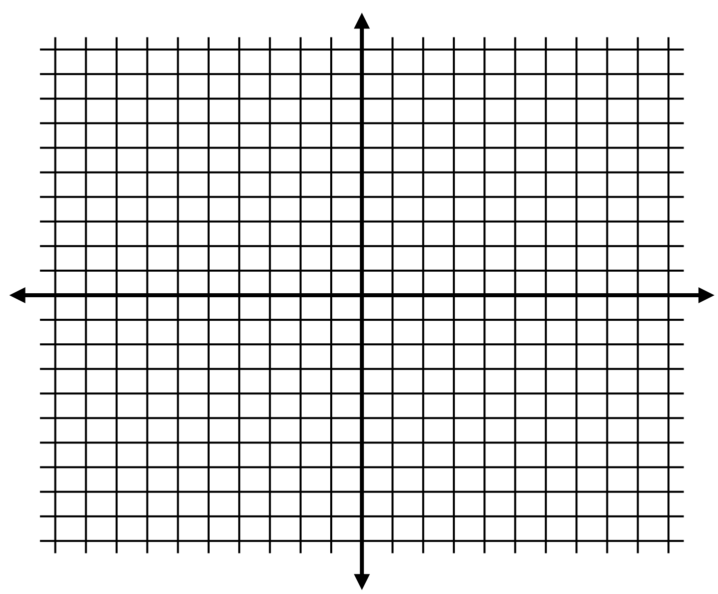
Ex: $-x^2 + 2x = 1$



Ex: $x^2 + 7 = 4x$



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



Graph the following quadratic equations on a graphing calculator and identify the solutions.

Ex: $x^2 + 4x = 5$

Ex: $-x^2 - 6x = 9$

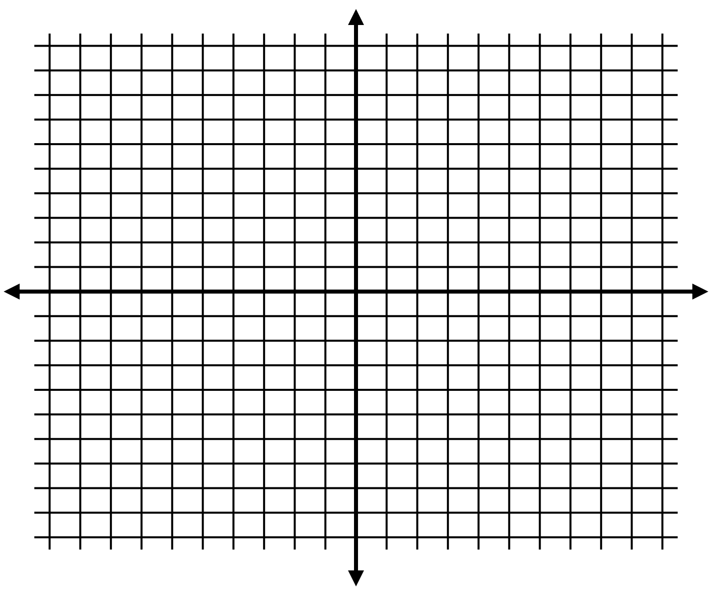
Ex: $x^2 + 4x = -6$

Ex: $x^2 + x = -1$

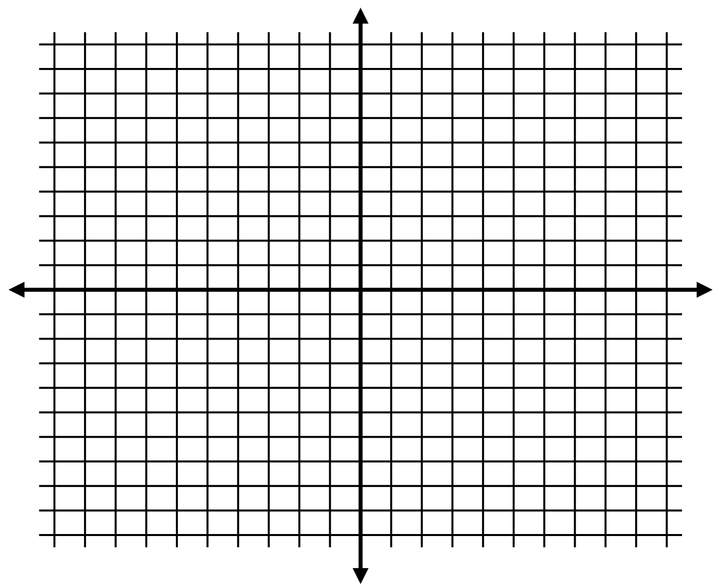
Ex: $-x^2 + 6x = 9$

Find the zeros of the function.

Ex: $f(x) = x^2 + 6x - 7$

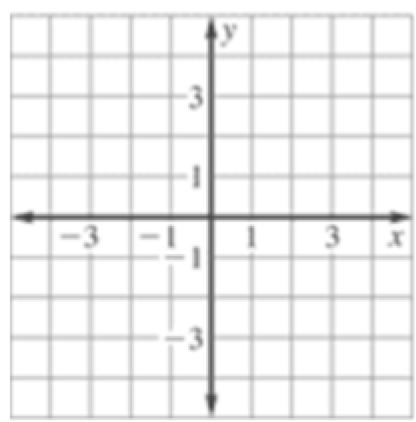


Ex: $f(x) = x^2 + 7x + 6$



Approximate zeros to the nearest tenth:

Ex: $f(x) = x^2 + 4x + 1$



1.

2.

3.

x	–0.9	–0.8	–0.7	–0.6	–0.5	–0.4	–0.3	–0.2	–0.1
y									

x	–3.9	–3.8	–3.7	–3.6	–3.5	–3.4	–3.3	–3.2	–3.1
y									

Use a graphing calculator to solve.

Ex: $f(x) = x^2 + x - 6$

Ex: $f(x) = -x^2 + 2x + 2$

Ex: An athlete throws a shot put with an initial vertical velocity of 40 ft/s.

a) Write an equation that models the height of the shot put as a function of the time it is in the air.

b) Use the equation to find the time the shot put is in the air.

Ex: A baseball player throws a ball into the air with an initial vertical velocity of 32 ft/s and is released at a height of 5 feet.

a) Write an equation that models the height of the ball based on time in the air.

b) Find out how long the ball is in the air.