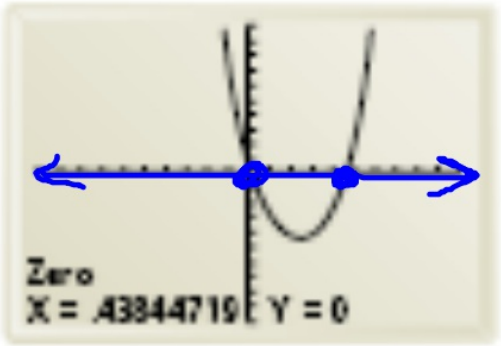
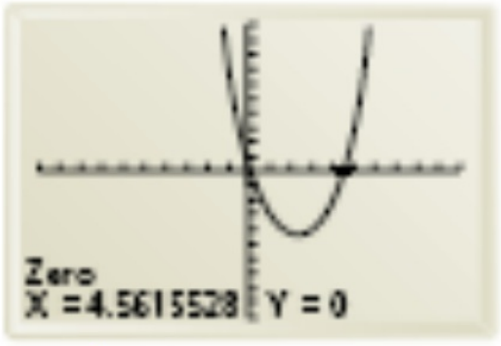
Lesson 6.2: Solving Quadratic Equations by Graphing

When a quadratic function is set equal to a value, the result is a quadratic equation. A quadratic equation can be written in the form:

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

The *solutions* of a quadratic equation are called the **roots** of the equation. One method for finding the roots of a quadratic equation is to find the ***zeros*** of the related quadratic function. The zeros of the function are the *x-intercepts* of its graph. These are the solutions of the related equation because $f(x) = 0$ at those points.



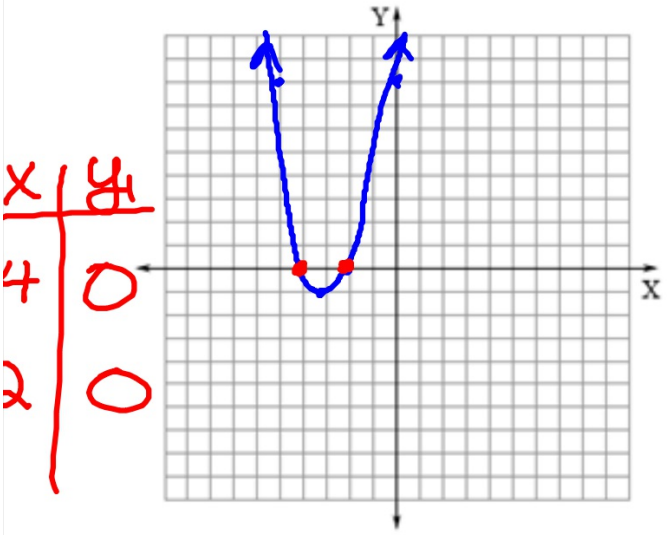


$y = ax^2 + bx + c$

$0 = ax^2 + bx + c$

1. Solve each equation by graphing.

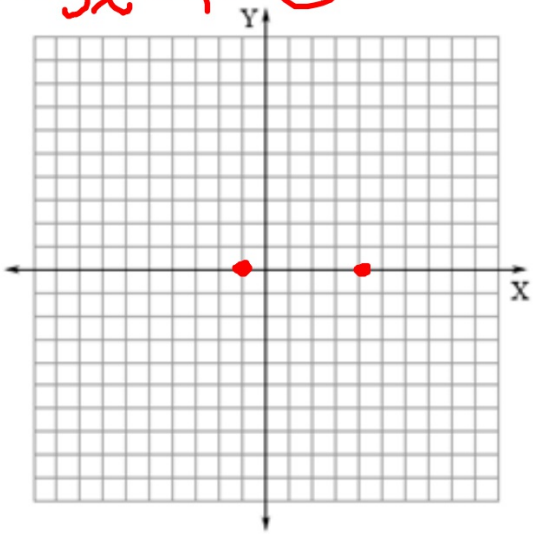
a. $x^2+6x+8=0$



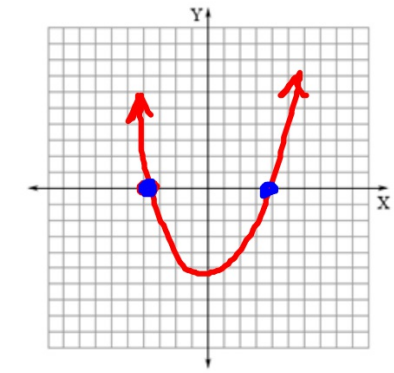
x	y
-4	0
-2	0

b. $x^2 - 3x = 4$

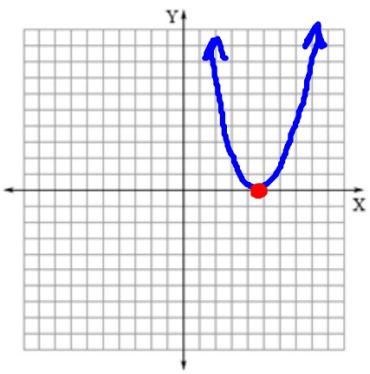
$x^2-3x-4=0$



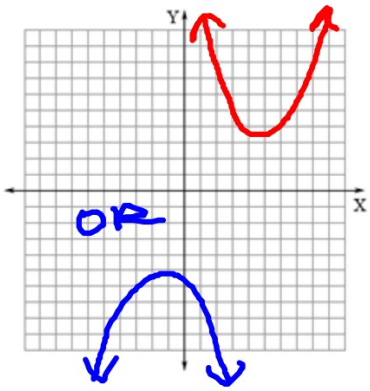
Solutions of a Quadratic Equation



2 solutions



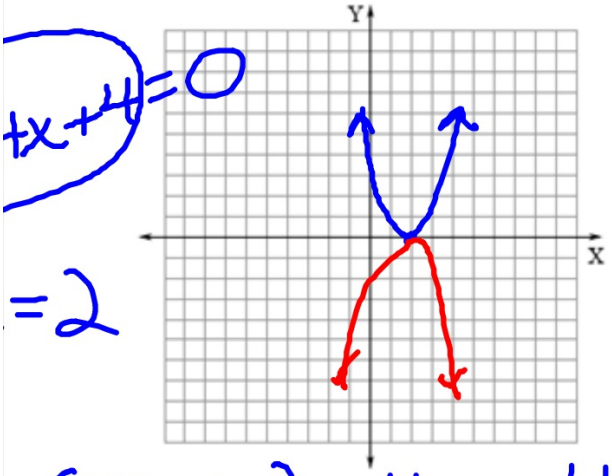
1 solution



NO solution

2. Solve by graphing.

a. $x^2 - 4x = -4$

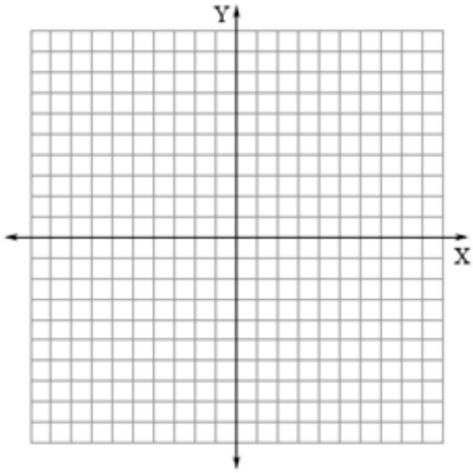


$+x+4=0$

$=2$

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

b. $8x - x^2 = 16$



3. Find two real numbers whose sum is 4 and whose product is 5 or show that no such number exist.

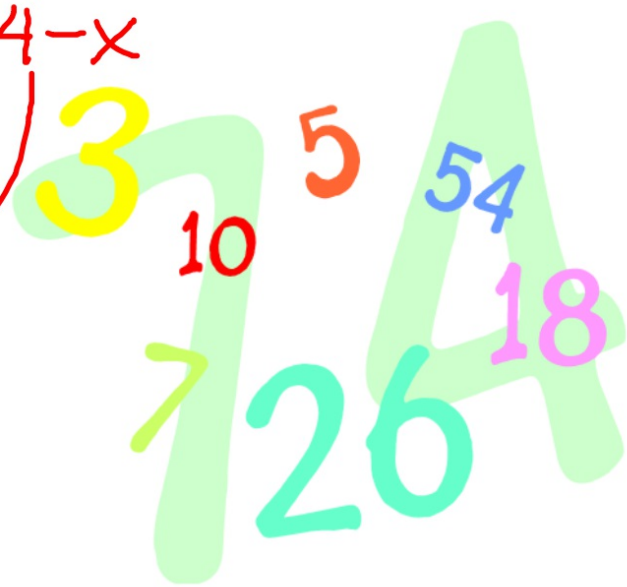
$x+y=4$ $\quad y=4-x$

$x \cdot y=5$

$x(4-x)=5$

$4x-x^2=5$

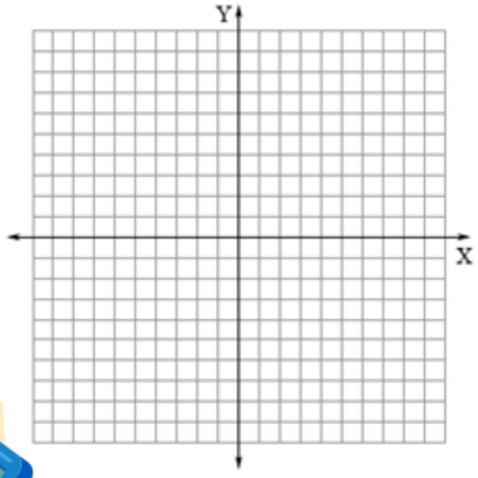
$0=x^2-4x+5$



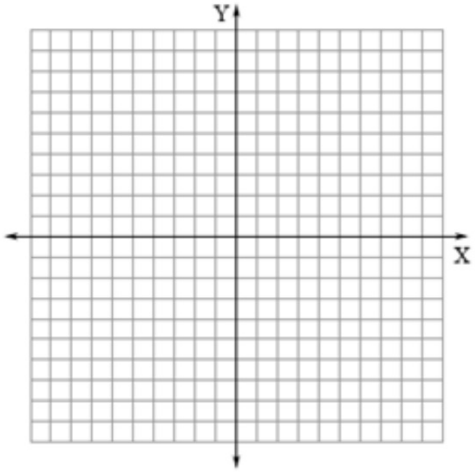
Often exact roots cannot be found by graphing. In this case, you can estimate solutions by stating the consecutive integers between which the roots are located.

4. Solve each equation by graphing. If exact roots cannot be found, state the consecutive integers between which the roots are located.

a. $x^2 - 6x + 3 = 0$



b. $-x^2 + 4x - 1 = 0$



5. The highest bridge in the United States is the Royal Gorge Bridge in Colorado. The deck of the bridge is 1053 feet above the river below. Suppose a marble is dropped over the railing from a height of 3 feet above the bridge deck. How long will it take the marble to reach the surface of the water, assuming there is no air resistance? Use the formula $h(t) = -16t^2 + h_0$ where t is the time in seconds and h_0 is the initial height above the water in feet.

$h(t) = -16t^2 + h_0$

$-\frac{1}{2}g \cdot t^2$

$h = -16t^2 + 1056$

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