

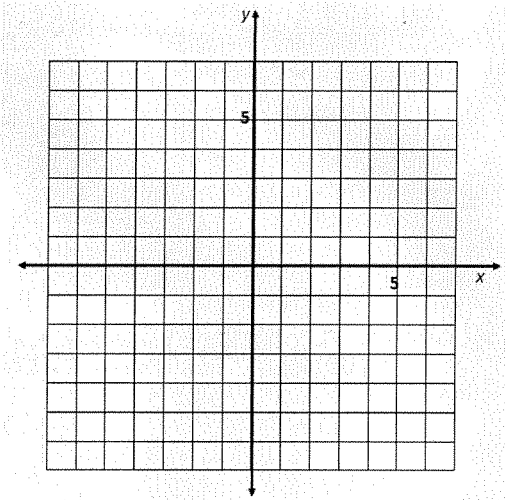
Name: \_\_\_\_\_

## Sec. 10.3: Solve Quadratic Equations by Graphing

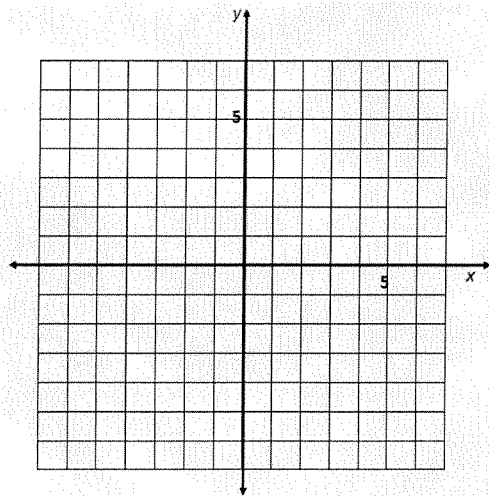
We can solve quadratic equations of the form  $ax^2 + bx + c = 0$  by several means. We have already solved several such equations by factoring. We can also graph them and look for the zeros of the function—the location(s) where the graph intersects the  $x$ -axis.

### Examples

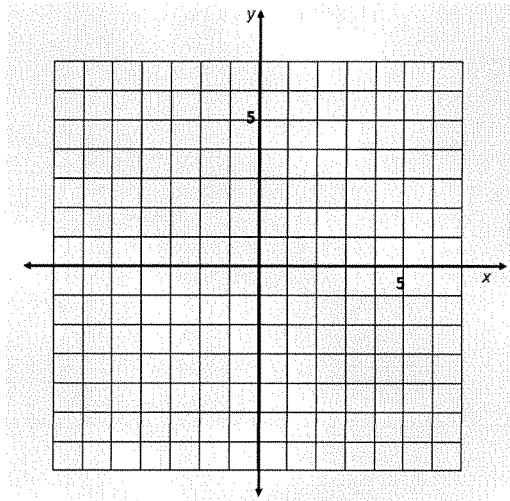
1. Solve  $3x^2 - 3x - 6 = 0$  by graphing.



2. Solve  $-2x^2 - 4x = 2$  by graphing.



3. Solve  $x^2 + 5 = 2x$  by graphing.



4. A cannonball is launched into the air and follows the trajectory  $h = -16t^2 + 450t + 10$ , where  $h$  is the height of the cannonball (in feet) and  $t$  is the time (in seconds) that the cannonball has been in the air. Determine how long it takes before the cannonball strikes the ground.

## Sec. 10.3 Practice Problems

Solve each equation by *graphing*.

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

2)  $m^2 + 4m - 5 = 0$

3)  $n^2 - n - 20 = 0$

4)  $r^2 + r - 12 = 0$

5)  $v^2 = -4v$

6)  $x^2 - 5 = 4x$

7)  $b^2 + 12b = -32$

8)  $x^2 = -8x$

9)  $3a^2 - a = 2$

10)  $3p^2 + 8 = -11p$

11)  $3k^2 - 32 = -4k$

12)  $5x^2 + 24 = -23x$

13)  $5m^2 + 12 = 32m$

14)  $30n^2 = 55n - 25$

15)  $5r^2 - 2r = 0$

16)  $5x^2 - 7x = 0$

17) Find the zeros of the function:  $y = 4x^2 + x - 2$ .

18) A student on a field trip threw a rock (for experimental purposes, of course) from a high hill. The rock followed the trajectory described by  $h = -16t^2 + 25t + 40$  where  $h$  is the height of the rock in feet and  $t$  is the time in seconds. How long will it take for the rock to hit the ground?

## Answers to Sec. 10.2 Practice Problems

1)  $\{1, 4\}$

5)  $\{-4, 0\}$

9)  $\left\{-\frac{2}{3}, 1\right\}$

13)  $\left\{\frac{2}{5}, 6\right\}$

17)  $-0.84, 0.59$

2)  $\{1, -5\}$

6)  $\{5, -1\}$

10)  $\left\{-\frac{8}{3}, -1\right\}$

14)  $\left\{\frac{5}{6}, 1\right\}$

18) 2.54 seconds

3)  $\{-4, 5\}$

7)  $\{-8, -4\}$

11)  $\left\{\frac{8}{3}, -4\right\}$

15)  $\left\{\frac{2}{5}, 0\right\}$

4)  $\{-4, 3\}$

8)  $\{-8, 0\}$

12)  $\left\{-\frac{8}{5}, -3\right\}$

16)  $\left\{\frac{7}{5}, 0\right\}$