NAME _____ DATE _____ PERIOD _____

3-2 Study Guide and Intervention

Solving Linear Equations by Graphing

Solve by Graphing You can solve an equation by graphing the related function. The solution of the equation is the x-intercept of the function.

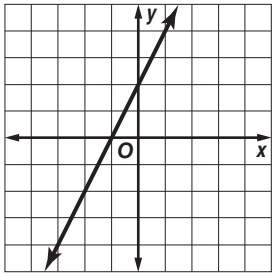
Example **Solve the equation $2x - 2 = -4$ by graphing.**

First set the equation equal to 0. Then replace 0 with $f(x)$. Make a table of ordered pair solutions. Graph the function and locate the x-intercept.

$2x - 2 = -4$	Original equation
$2x - 2 + 4 = -4 + 4$	Add 4 to each side.
$2x + 2 = 0$	Simplify.
$f(x) = 2x + 2$	Replace 0 with $f(x)$.

To graph the function, make a table. Graph the ordered pairs.

x	$f(x) = 2x + 2$	$f(x)$	$[x, f(x)]$
1	$f(1) = 2(1) + 2$	4	(1, 4)
-1	$f(-1) = 2(-1) + 2$	0	$(-1, 0)$
-2	$f(-2) = 2(-2) + 2$	-2	$(-2, -2)$



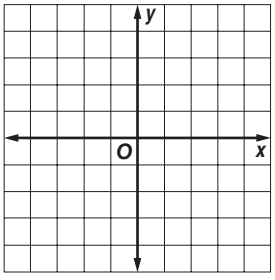
The graph intersects the x-axis at $(-1, 0)$.

The solution to the equation is $x = -1$.

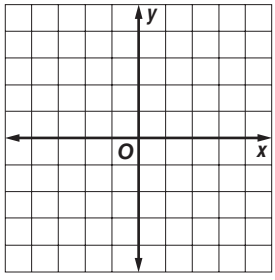
Exercises

Solve each equation.

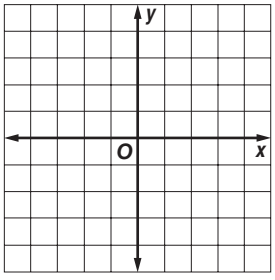
1. $3x - 3 = 0$



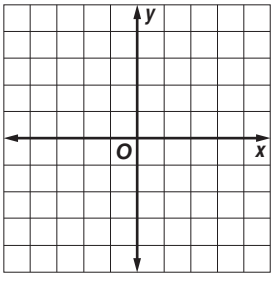
2. $-2x + 1 = 5 - 2x$



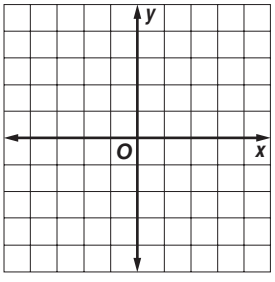
3. $-x + 4 = 0$



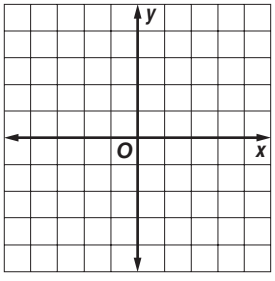
4. $0 = 4x - 1$



5. $5x - 1 = 5x$



6. $-3x + 1 = 0$



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3-2 Study Guide and Intervention *(continued)*

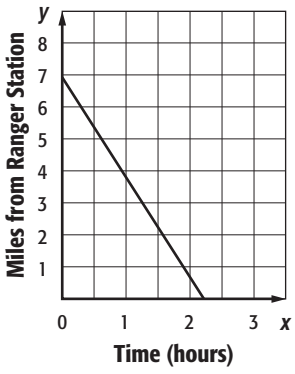
Solving Linear Equations by Graphing

Estimate Solutions by Graphing Sometimes graphing does not provide an exact solution, but only an estimate. In these cases, solve algebraically to find the exact solution.

Example **WALKING** **You and your cousin decide to walk the 7-mile trail at the state park to the ranger station. The function $d = 7 - 3.2t$ represents your distance d from the ranger station after t hours. Find the zero of this function. Describe what this value means in this context.**

Make a table of values to graph the function.

t	$d = 7 - 3.2t$	d	(t, d)
0	$d = 7 - 3.2(0)$	7	(0, 7)
1	$d = 7 - 3.2(1)$	3.8	(1, 3.8)
2	$d = 7 - 3.2(2)$	0.6	(2, 0.6)

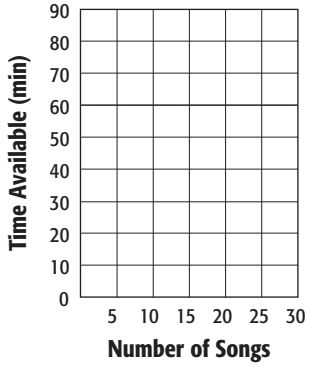


The graph intersects the t–axis between $t = 2$ and $t = 3$, but closer to $t = 2$. It will take you and your cousin just over two hours to reach the ranger station.

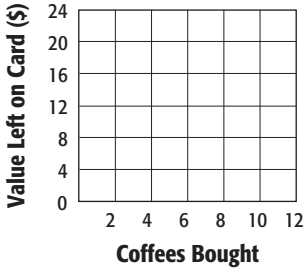
You can check your estimate by solving the equation algebraically.

Exercises

1. **MUSIC** Jessica wants to record her favorite songs to one CD. The function $C = 80 - 3.22n$ represents the recording time C available after n songs are recorded. Find the zero of this function. Describe what this value means in this context.



2. **GIFT CARDS** Enrique uses a gift card to buy coffee at a coffee shop. The initial value of the gift card is \$20. The function $n = 20 - 2.75c$ represents the amount of money still left on the gift card n after purchasing c cups of coffee. Find the zero of this function. Describe what this value means in this context.



Lesson 3-2

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