

NAME: _____

Math _____, Period _____

Mr. Rogove

Date: _____

LEARNING OBJECTIVE: We will solve linear equations using the **standard form of a linear equation.** (G8M4L11)

EXPLORATION:

Brandon tells you he scored 32 points in a basketball game with ONLY two- and three- point shots (no free throws). How many of each type of basket did he score? Use the table to organize your work.

Number of two-pointers	Number of three-pointers
16	0
13	2
10	4
7	6
4	8
1	10

Let x be the number of two-pointers he scored, and y be the number of three-pointers he scored. Write an equation to represent the situation.

$$\frac{32 - 2x}{3} = y$$

$$2x + 3y = 32$$

$a = 2$

$b = 3$

$c = 32$

CONCEPT DEVELOPMENT:

Standard Form of a Linear Equation

$$ax + by = c$$

a , b , and c are constants and at least one of a or b does not equal zero

a, b, c should be integers, $a > 0$

Example:

$$-50x + y = 15$$

$$50x - y = -15$$

when $x = 2$, what is y ?

$$y = 115$$

$(2, 115)$ is NOT a solution

$$50(2) - y = -15$$

$$100 - y = -15$$

$$-y = -115$$

$$y = 115$$

when $y = 10$, what is x ?

$$50x - y = -15$$

$$50x - 10 = -15$$

$$\frac{50x}{50} = \frac{-5}{50}$$

$$x = -\frac{1}{10}$$

A **solution to a linear equation** is an ordered pair of numbers (x, y) so that x and y make the equation a true statement.

We can find solutions by 'fixing a number for x or y ' and solving for the other variable.

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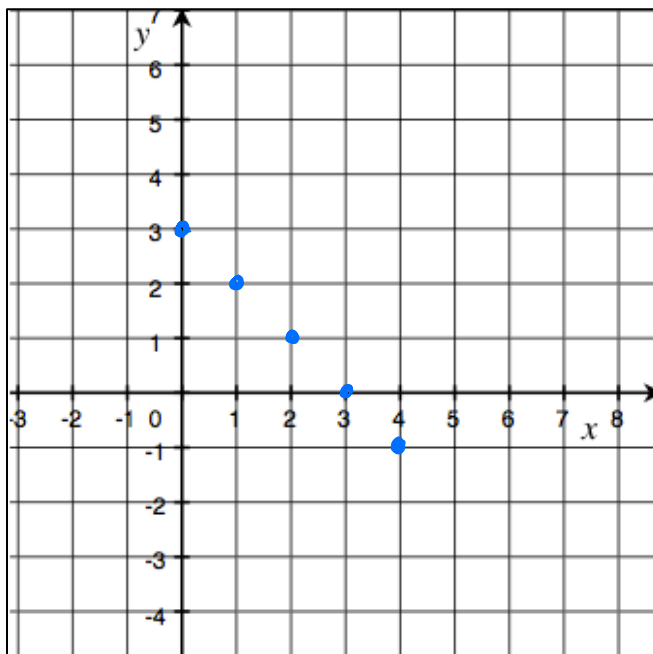
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GUIDED PRACTICE:**Steps for Finding Solutions to Linear Equations Written in Standard Form**

1. Create a table.
2. Fix a number for x and solve for y (or vice versa).
3. Plot each point on a graph.
4. List the solutions as ordered pairs

Find five solutions for the linear equation $x + y = 3$ and plot the solutions as points on a coordinate plane.

x	Linear equation $x + y = 3$	y	Solution (x, y)
0	$0 + y = 3$	3	$(0, 3)$
1	$1 + y = 3$	2	$(1, 2)$
2	$2 + y = 3$	1	$(2, 1)$
3	$3 + y = 3$	0	$(3, 0)$
4	$4 + y = 3$	-1	$(4, -1)$



$(8, -5)$?
Yes!
 $(113, -110)$
Yes!
 $(-110, 113)$
Yes!
 $(-113, 110)$
No!
 $(10, -7)$

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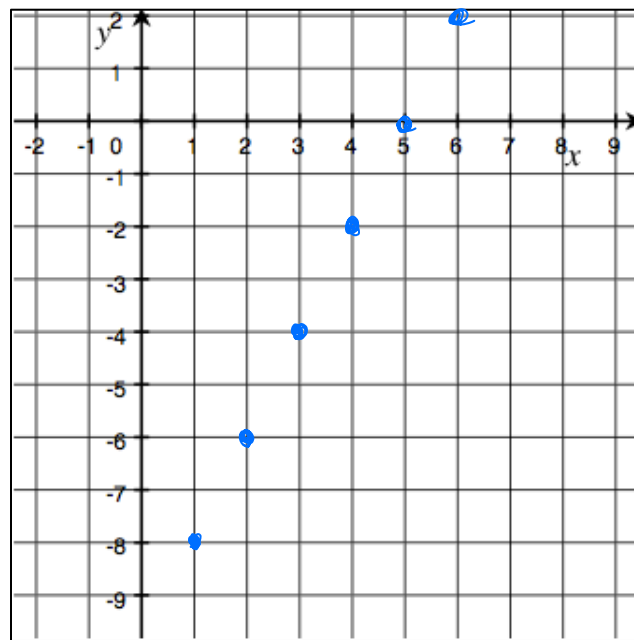
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Find five solutions to the linear equation $2x - y = 10$ and then plot the solutions as points on a coordinate plane.

x	Linear equation $2x - y = 10$	y	Solution (x, y)
1	$2(1) - y = 10$ $2 - y = 10$	-8	(1, -8)
2	$2(2) - y = 10$ $4 - y = 10$	-6	(2, -6)
3	$2(3) - y = 10$ $6 - y = 10$	-4	(3, -4)
4	$2(4) - y = 10$ $8 - y = 10$	-2	(4, -2)
5	$2(5) - y = 10$ $10 - y = 10$	0	(5, 0)



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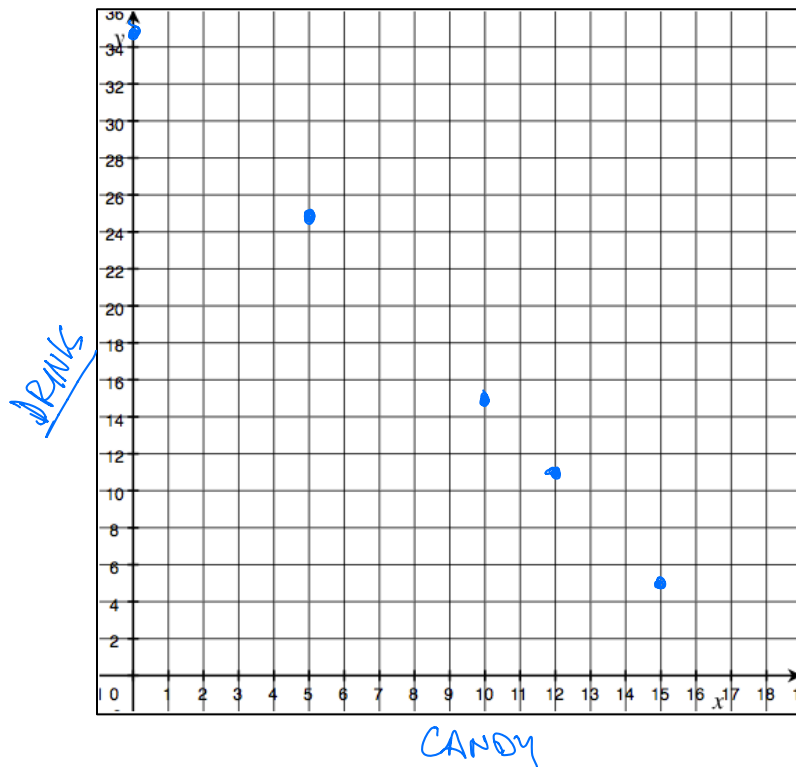
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At the store, you can buy a bag of candy for \$2 and a drink for \$1. Assume you have a total of \$35 to spend and you are feeling generous and want to buy some snacks for your friends. Write an equation in standard form to represent the number of bags of candy, x , and number of drinks, y , you can buy with your \$35.

$$2x + y = 35$$

Find five solutions to the linear equation and plot the solutions as points on the coordinate plane.

x (candy)	Linear equation	y (drinks)	Solution (x, y)
5	$2(5) + y = 35$	25	(5, 25)
10	$2(10) + y = 35$	15	(10, 15)
15	$2(15) + y = 35$	5	(15, 5)
0	$2(0) + y = 35$	35	(0, 35)
12	$2(12) + y = 35$	11	(12, 11)



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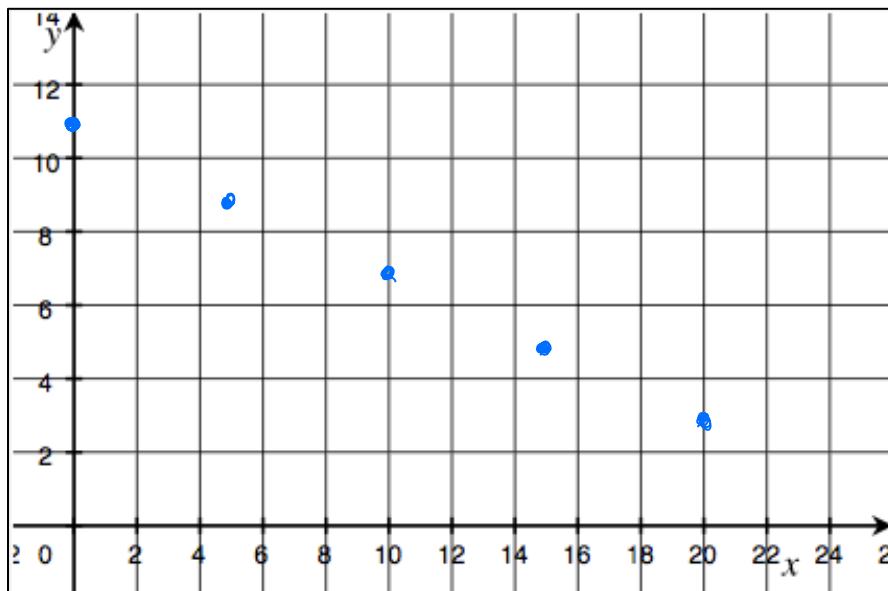
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Find five solutions to the linear equation $\frac{2}{5}x + y = 11$ and then plot the solutions as points on a coordinate plane.

$$\underline{2x + 5y = 55}$$

x	Linear equation	y	Solution (x, y)
	$\frac{2}{5}x + y = 11$		
0	$\frac{2}{5}(0) + y = 11$	11	(0, 11)
5	$\frac{2}{5}(5) + y = 11$	9	(5, 9)
10	$\frac{2}{5}(10) + y = 11$	7	(10, 7)
15		5	(15, 5)
20		3	(20, 3)



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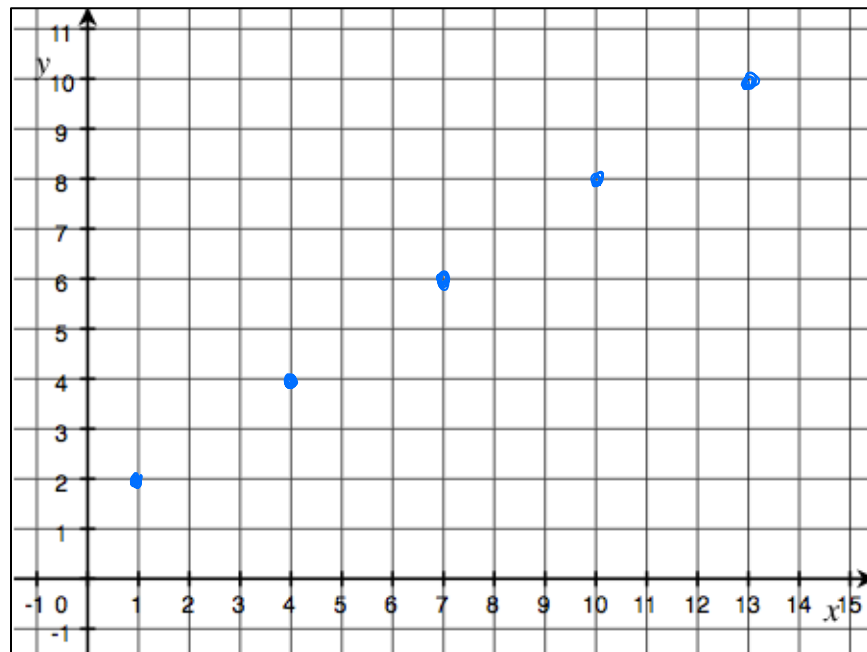
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Find five solutions to the linear equation $x - \frac{3}{2}y = -2$ and then plot the solutions as points on a coordinate plane.

$$2x - 3y = -4$$

x	Linear equation	y	Solution (x, y)
	$x - \frac{3}{2}y = -2$		
1	$x - \frac{3}{2}(2) = -2$	2	(1, 2)
4	$x - \frac{3}{2}(4) = -2$	4	(4, 4)
7	$x - \frac{3}{2}(6) = -2$	6	(7, 6)
10		8	
13		10	



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INDEPENDENT PRACTICE:

Hand out Problem Set—whatever doesn't get done is HW.

CLOSURE:

Hand out exit ticket for lesson 12

TEACHER NOTES:

Matches lesson 12 from mod 4, grade 8