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
1	10
4	8
7	6
10	4
16	0
13	2

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.

$2x+3y=32$

$a=2$
$b=3$
$c=32$

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

Example:

$-50x + y = 15$

$x=2$

$-50(2)+y=15$

$-100+y=15$

$y=115$

$(2, 115)$

$2x+3y=32$

$y=10$

$-50x+10=15$

$-50x=5$

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

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

$(-\frac{1}{10}, 10)$

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.

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

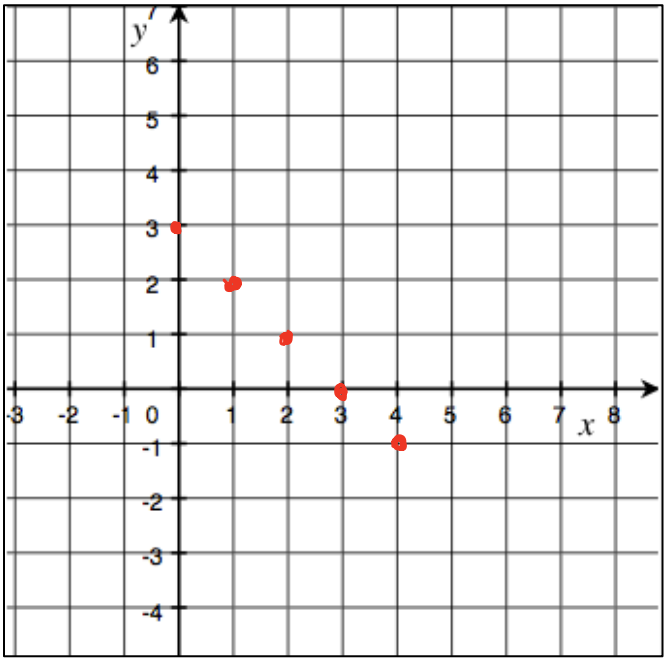
GUIDED PRACTICE:

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)



$x = -10$?

$-10 + 13 = 3$

$-4.5, 7.5$.

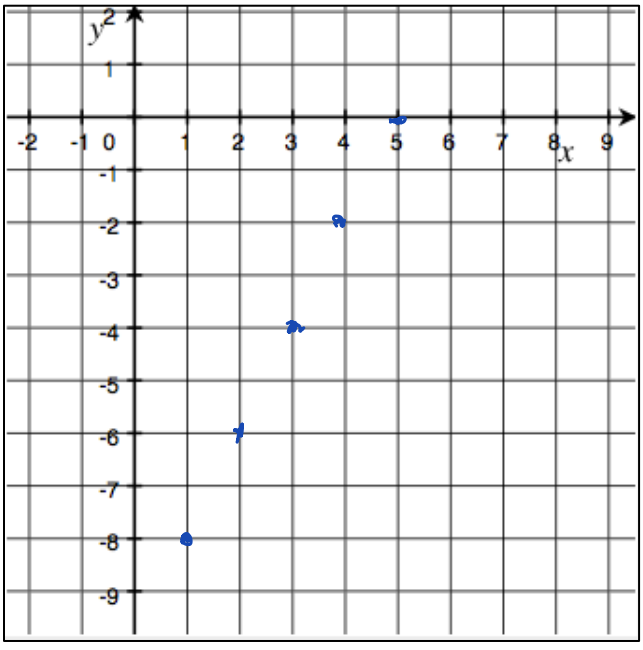
Is (8, −5) a solution?

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

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



NAME:_____ Math _____ , Period _____

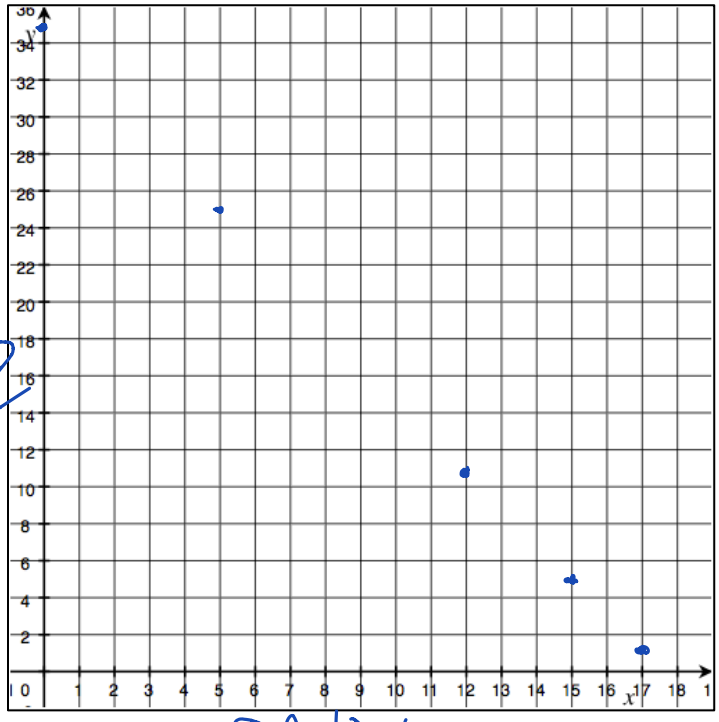
Mr. Rogove Date:_____

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.

$2x + 1y = 35$

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)
0	$2(0)+y=35$	35	(0,35)
17	$2(17)+1=35$	1	(17,1)
5	$2(5)+y=35$	25	(5,25)
12	$2(12)+y=35$	11	(12,11)
15	$2(15)+y=35$	5	(15,5)



DRINKS

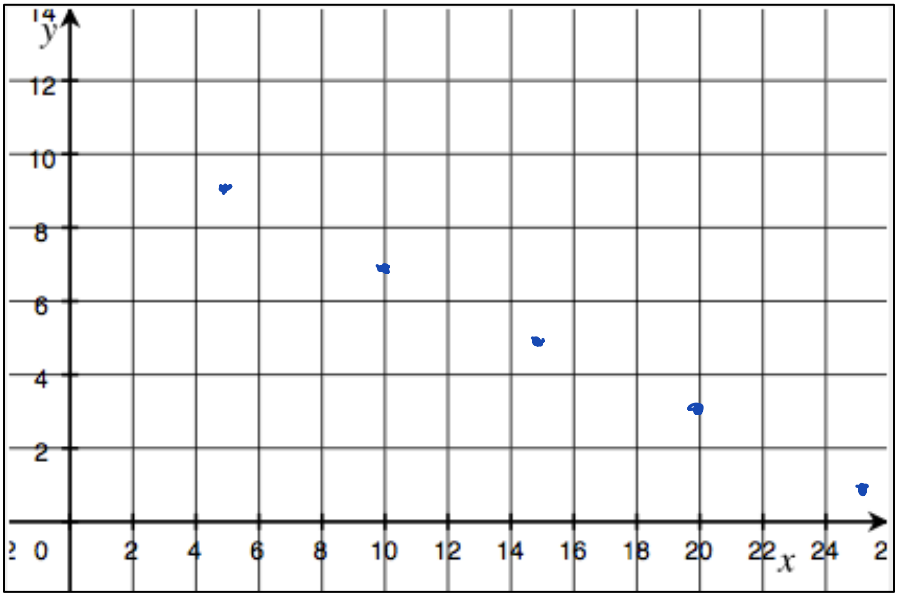
CANDY

NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

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

x	**Linear equation** $\frac{2}{5}x + y = 11$	y	**Solution** (x, y)
5	$2x+5y=55$	9	(5, 9)
10		7	(10, 7)
15		5	(15, 5)
20		3	(20, 3)
25	$\frac{2}{5}(25)+y=11$	1	(25, 1)
30		-1	

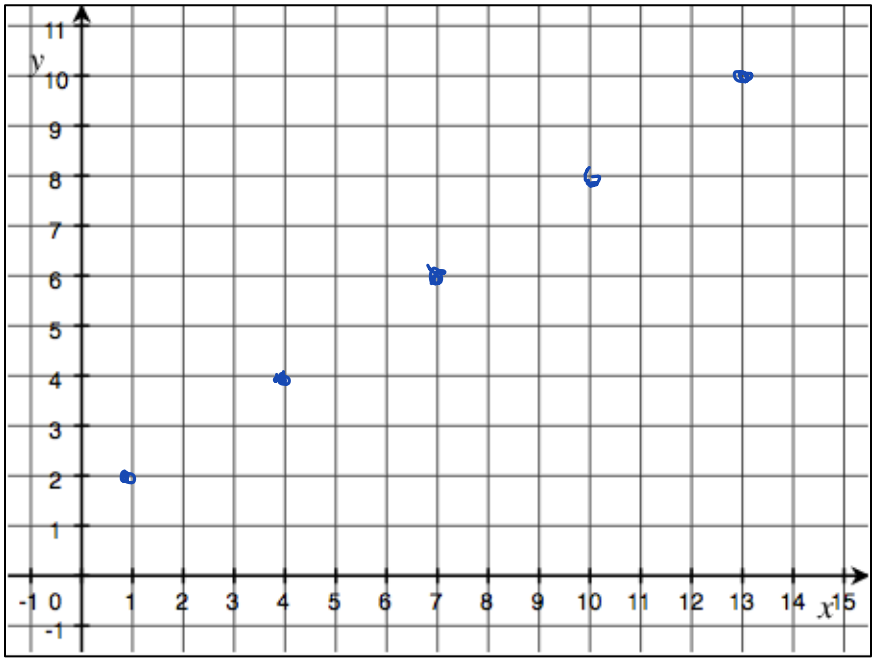


NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

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

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



NAME:_____ Math _____ , Period _____

Mr. Rogove Date:_____

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