

Lesson 12: Linear Equations in Two Variables

Classwork

Opening Exercise

Emily tells you that she scored 32 points in a basketball game. Write down all the possible ways she could have scored 32 with only two- and three-point baskets. Use the table below to organize your work.

Number of Two-Pointers	Number of Three-Pointers

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

Exploratory Challenge/Exercises

1. 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

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

x	Linear Equation: $2x - y = 10$	y

3. Find five solutions for the linear equation $x + 5y = 21$, and plot the solutions as points on a coordinate plane.

x	Linear Equation: $x + 5y = 21$	y

4. Consider the linear equation $\frac{2}{5}x + y = 11$.
- a. Will you choose to fix values for x or y ? Explain.

- b. Are there specific numbers that would make your computational work easier? Explain.

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

x	Linear Equation: $\frac{2}{5}x + y = 11$	y

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

- b. Find five solutions to the linear equation from part (a), and plot the solutions as points on a coordinate plane.

x	Linear Equation:	y

Lesson Summary

A linear equation in two-variables x and y is in standard form if it is of the form $ax + by = c$ for numbers a , b , and c , where a and b are both not zero. The numbers a , b , and c are called constants.

A solution to a linear equation in two variables is the ordered pair (x, y) that makes the given equation true. Solutions can be found by fixing a number for x and solving for y or fixing a number for y and solving for x .

Problem Set

- Consider the linear equation $x - \frac{3}{2}y = -2$.
 - Will you choose to fix values for x or y ? Explain.
 - Are there specific numbers that would make your computational work easier? Explain.
 - Find five solutions to the linear equation $x - \frac{3}{2}y = -2$, and plot the solutions as points on a coordinate plane.

x	Linear Equation: $x - \frac{3}{2}y = -2$	y

- Find five solutions for the linear equation $\frac{1}{3}x + y = 12$, and plot the solutions as points on a coordinate plane.
- Find five solutions for the linear equation $-x + \frac{3}{4}y = -6$, and plot the solutions as points on a coordinate plane.
- Find five solutions for the linear equation $2x + y = 5$, and plot the solutions as points on a coordinate plane.
- Find five solutions for the linear equation $3x - 5y = 15$, and plot the solutions as points on a coordinate plane.