# **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.





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## **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: $x + y = 3$	у

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

x	Linear Equation: $2x - y = 10$	у

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

x	Linear Equation: $x + 5y = 21$	у

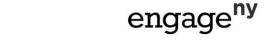
- 4. Consider the linear equation  $\frac{2}{5}x + y = 11$ .
  - a. Will you choose to fix values for x or y? Explain.

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.

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

- 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.



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

	Linear Equation:	
x		у

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### **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**

- 1. Consider the linear equation  $x \frac{3}{2}y = -2$ .
  - 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  $x \frac{3}{2}y = -2$ , and plot the solutions as points on a coordinate plane.

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

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



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