Lesson 20A: Solution Sets to Equations with Two Variables

Classwork

Exercise 1

* 1. Circle all the ordered pairs that are solutions to the equation .

* 1. How did you decide whether or not an ordered pair was a solution to the equation?

Exercise 2

a. Now, find 5 more solutions to the equation where one or more variables

[](http://www.google.com/imgres?imgurl&imgrefurl=http://www.crestviewlocal.k12.oh.us/chs/staff/mcc/cp10.html&h=0&w=0&sz=1&tbnid=r8ugDHFRf1kAzM&tbnh=225&tbnw=224&prev=/search?q=coordinate+plane&tbm=isch&tbo=u&zoom=1&q=coordinate%20plane&docid=bc5yn1XHt6D8NM&hl=en&ei=hny_Ua2aKumSiALt9YHoCw&ved=0CAEQsCU)are negative numbers or non-integer values. Be prepared to share the strategies you used to find your solutions.

b. Create a visual representation of the solution set by plotting each solution as a point in the coordinate plane.

c. How many ordered pairs will be in the solution set of the equation ?

d. Why does it make sense to represent the solution to the equation

as a line in the coordinate plane?

**[](http://www.google.com/imgres?imgurl&imgrefurl=http://www.crestviewlocal.k12.oh.us/chs/staff/mcc/cp10.html&h=0&w=0&sz=1&tbnid=r8ugDHFRf1kAzM&tbnh=225&tbnw=224&prev=/search?q=coordinate+plane&tbm=isch&tbo=u&zoom=1&q=coordinate%20plane&docid=bc5yn1XHt6D8NM&hl=en&ei=hny_Ua2aKumSiALt9YHoCw&ved=0CAEQsCU)Exercises 3–5**

3a. The sum of two numbers is . What are the numbers?

b. Create an equation using two variables to represent this situation. Be sure to explain the meaning of each variable.

c. List at least solutions to the equation you created in part (a).

d. Create a graph that represents the solution set to the equation.

4a. Gia had songs in a playlist composed of songs from her two favorite artists, Beyonce and Jennifer Lopez. How many songs did she have by each one in the playlist?

[](http://www.google.com/imgres?imgurl&imgrefurl=http://www.crestviewlocal.k12.oh.us/chs/staff/mcc/cp10.html&h=0&w=0&sz=1&tbnid=r8ugDHFRf1kAzM&tbnh=225&tbnw=224&prev=/search?q=coordinate+plane&tbm=isch&tbo=u&zoom=1&q=coordinate%20plane&docid=bc5yn1XHt6D8NM&hl=en&ei=hny_Ua2aKumSiALt9YHoCw&ved=0CAEQsCU)

b. Create an equation using two variables to represent this situation.

Be sure to explain the meaning of each variable.

c. List at least solutions to the equation you created in part (a).

d. Create a graph that represents the solution set to the equation.

5. Compare your solutions to Exercises and . How are they alike? How are they different?

**Exercises 6-9**

**Sometimes it is helpful to first rewrite an equation by solving for y.**

Solve each of the following for y.

6. x + y = 4 7. 3x – 5y = 15 8. 4(y – 2x) = 12 9. 3y + 2x = 10

**Choose** five values for the domain(x) and make a table.

|  |  |  |  |
| --- | --- | --- | --- |
| Domain  x |  | Range  y | Ordered Pair  (x, y) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Lesson Summary

An ordered pair is a *solution* to a two variable equation when each number substituted into its corresponding variable makes the equation a true number sentence. All of the solutions to a two variable equation are called the *solution set*.

Each ordered pair of numbers in the solution set of the equation corresponds to a point on the coordinate plane. The set of all such points in the coordinate plane is called the *graph of the equation.*

Problem Set 20A

1. Graph the solution set in the coordinate plane.

Label at least two ordered pairs that are solutions on your graph.

**[](http://www.google.com/imgres?imgurl&imgrefurl=http://www.crestviewlocal.k12.oh.us/chs/staff/mcc/cp10.html&h=0&w=0&sz=1&tbnid=r8ugDHFRf1kAzM&tbnh=225&tbnw=224&prev=/search?q=coordinate+plane&tbm=isch&tbo=u&zoom=1&q=coordinate%20plane&docid=bc5yn1XHt6D8NM&hl=en&ei=hny_Ua2aKumSiALt9YHoCw&ved=0CAEQsCU)**

|  |  |  |  |
| --- | --- | --- | --- |
| x |  | y | Ordered Pair  (x, y) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**[](http://www.google.com/imgres?imgurl&imgrefurl=http://www.crestviewlocal.k12.oh.us/chs/staff/mcc/cp10.html&h=0&w=0&sz=1&tbnid=r8ugDHFRf1kAzM&tbnh=225&tbnw=224&prev=/search?q=coordinate+plane&tbm=isch&tbo=u&zoom=1&q=coordinate%20plane&docid=bc5yn1XHt6D8NM&hl=en&ei=hny_Ua2aKumSiALt9YHoCw&ved=0CAEQsCU)**

|  |  |  |  |
| --- | --- | --- | --- |
| x |  | y | Ordered Pair  (x, y) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

c.

**[](http://www.google.com/imgres?imgurl&imgrefurl=http://www.crestviewlocal.k12.oh.us/chs/staff/mcc/cp10.html&h=0&w=0&sz=1&tbnid=r8ugDHFRf1kAzM&tbnh=225&tbnw=224&prev=/search?q=coordinate+plane&tbm=isch&tbo=u&zoom=1&q=coordinate%20plane&docid=bc5yn1XHt6D8NM&hl=en&ei=hny_Ua2aKumSiALt9YHoCw&ved=0CAEQsCU)**

|  |  |  |  |
| --- | --- | --- | --- |
| x |  | y | Ordered Pair  (x, y) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

d.

**[](http://www.google.com/imgres?imgurl&imgrefurl=http://www.crestviewlocal.k12.oh.us/chs/staff/mcc/cp10.html&h=0&w=0&sz=1&tbnid=r8ugDHFRf1kAzM&tbnh=225&tbnw=224&prev=/search?q=coordinate+plane&tbm=isch&tbo=u&zoom=1&q=coordinate%20plane&docid=bc5yn1XHt6D8NM&hl=en&ei=hny_Ua2aKumSiALt9YHoCw&ved=0CAEQsCU)**

|  |  |  |  |
| --- | --- | --- | --- |
| x |  | y | Ordered Pair  (x, y) |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

2. Mari and Lori are starting a business to make gourmet coffee. They gather the following information from another business about prices for different amounts of coffee. Which equation and which graph are most likely to model the price forpounds of coffee? Justify your reasoning.

Graph Graph



|  |  |
| --- | --- |
| Pounds | Price for pounds |
|  | $ |
|  | $ |
|  | $ |
|  | $ |

Equation A:

Equation B:

Lesson 20B: Solution Sets to Equations with Two Variables

|  |
| --- |
| **Slope-Intercept Form**  A linear equation expressed in the form  **y = mx + b**  **m** is the slope  **b** is the y-intercept (where it crosses the y-axis) |

Write an equation of the line in slope-intercept form.

a. The slope is 2 and y-intercept is 3. b. The slope is –2; the y-intercept is 5.

c. The slope is ½; the y-intercept is -4. d. The slope is 0; the y-intercept is 2.

e. Find the slope and y-intercept of f. Find the slope and y-intercept of

y = 3x + 2. y = ⅓x.

g. Find the slope and y-intercept of h. Find the slope and y-intercept of

x + y = 4. 6x + 3y = 9.

Graphing Lines Using Slope-Intercept Form

**Find** the slope and y-intercept

**Plot** the point (0, b) y-intercept

**Use the slope** to locate a second point.

**Draw** a line through the two points.

**Graph the following equations using the slope-intercept form.**

y = -2x + 3 y – 4x = -5 y = 6

y = -2 x + 2 y = 1 x x = 6

3 2

Problem Set 20B

1. Match each equation with its graph. Explain your reasoning.



2

1



4

3



5