GreatHearts Irving

Remote Learning Packet

Please submit scans of written work in Google Classroom at the end of the week.

May 4-8, 2020

Course: Math Fundamentals

Teacher(s): Ms. Schweizer rose.schweizer@greatheartsirving.org

Weekly Plan:

Monday, May 4
☐ Read Pages 1-3
☐ Section 11.8 pg. 390 4-14 even
☐ Section 11.9 pg. 394 2-12 even

Tuesday, May 5
☐ Read Pages 4-6
☐ Watch Video on GC
☐ Section 11.9 pg. 394 19-37 odd

Wednesday, May 6
☐ Read Pages 7-9
☐ Section 11.9 pg. 395 39-46 all

Thursday, May 7
☐ Pages 10-12
☐ Watch Video on GC

Friday, May 8
☐ Attend office hours
☐ Catch-up or review the week's work

Statement of Academic Honesty

I affirm that the work completed from the packet is mine and that I completed it independently.

I affirm that, to the best of my knowledge, my child completed this work independently

_____
Student Signature

_____
Parent Signature

Monday, May 4

Today is review for last Thursday and Friday's lessons about graphing on the coordinate plane. Read pages 1-3 in the packet and complete the exercises on graph paper.
Head's up: next Monday and Tuesday you will have an assessment over Chapter 11, so take this time to review carefully.

Tuesday, May 5

Today is a continuation of graphing equations on the coordinate plane. Read pages 4-6 in the packet and complete the exercises on graph paper. Make sure to watch the instructional video on Google Classroom found under the Week 6 Topic.

Wednesday, May 6

This is the last lesson in Chapter 11. Today we are learning about graphing equations that do not form straight lines. Read pages 7-9 in the packet and complete the exercises on graph paper.

Thursday, May 7

I recommend printing out today's lesson (pages 10-12) if that is possible for you so that you have the review sheet and can work on the sheet itself and fill in the blanks wherever necessary. If that is not possible, copy down the questions on a separate sheet of paper, including the fill in the blanks. Watch the instructional video on Google Classroom.
Remember, take note of your questions and email me or ask during Friday's office hours.

Friday, May 8

Take time to go back and review your work from this week. Try to fix any mistakes and send me an email if there is still something that you are confused about. Next Monday and Tuesday you will have an assessment (split into two parts) over Chapter 11. If you are able, come to Office Hours at 9:30 to ask questions.

Answer Key:

Monday:

Since I have assigned the even exercises the answers are not in the back of the book. I can't easily create an answer key for graphs, but all of the equations should make a straight line on the graph. If they do not, check your calculations again.

Tuesday:

Correct the ones that are in the back of the book. If it is not in the back of the book, make sure that the graph is a straight line.

Wednesday:

All of your graphs should form a parabola. If it does not, check your work again.

Thursday:

I will give you an answer key, but not just yet. Hang tight.

1 Monday Recap

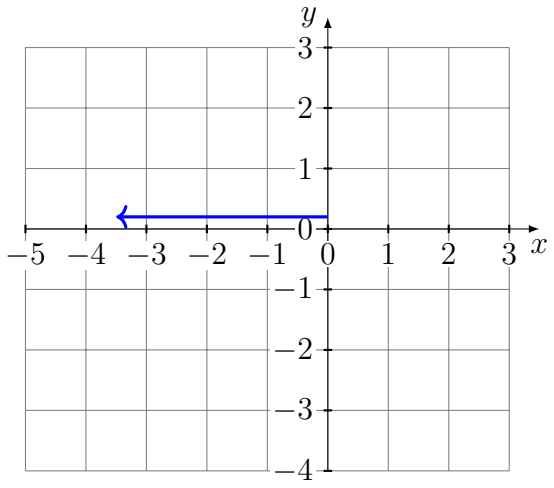
Before we dive into the new material for this week, let's review what we learned last week.

1.1 The Coordinate Plane

On Thursday we introduced the **coordinate plane**, which we use to create graphs. Each place in the coordinate plane has a specific name, or **coordinate** which is written using **ordered pairs**.

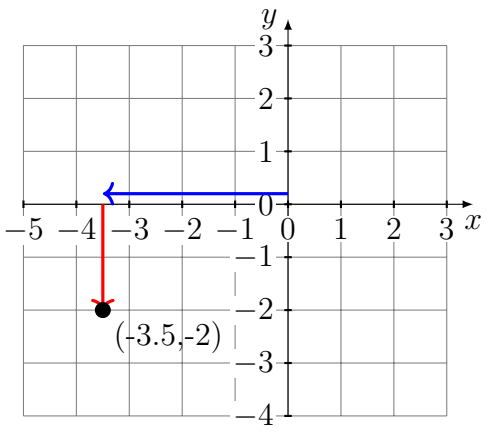
In what order are **ordered pairs** written in?

Let's practice graphing the point (-3.5, -2). Recall that the first number corresponds to the **x-axis**, the horizontal axis:



First we find -3.5 on the x-axis. Next, we move on to the second number that corresponds to the **y-axis**.

We move along the vertical axis until we reach -2. Then we graph our point!



1.2 Graphing Equations

On Friday we moved from graphing points to graphing lines, the relationship between two variables. If we have an equation with two unknown variables like

$$x + 1 = y$$

both variables can represent many different numbers. However, if we choose a value for one of them, for example:

$$x = -4$$

then we can find out the value of the other variable:

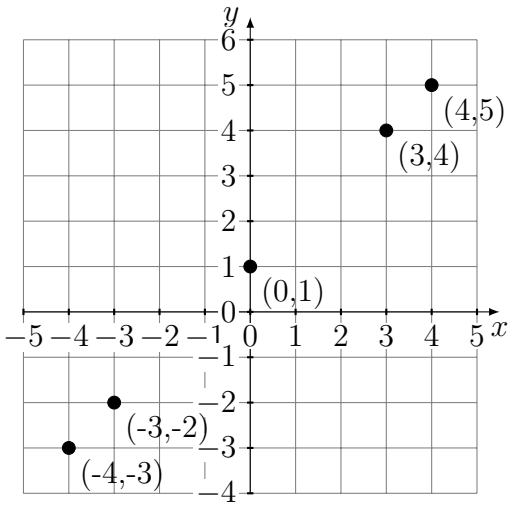
$$-4 + 1 = -3$$

$$y = -3$$

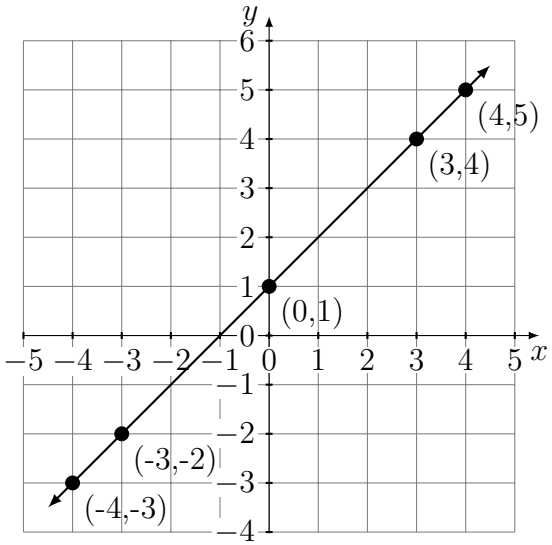
An easy way to organize this relationship is with a table.

x	$x + 1 = y$	Ordered Pair
-4	$-4 + 1 = -3$	(-4, -3)
-3	$-3 + 1 = -2$	(-3, -2)
0	$0 + 1 = 1$	(0, 1)
3	$3 + 1 = 4$	(3, 4)
4	$4 + 1 = 5$	(4,5)

An easy way to visualize the relationship is to graph the ordered pairs on the coordinate plane.



Now we can see that the relationship forms a straight line on the coordinate plane. Any point on the line will make our equation $x + 1 = y$ a true statement.



2 Graphing Equations with Multiple Operations

All of the equations with two variables we have graphed until now have only had addition and subtraction. Today we are going to try more complicated equations with multiplication and division. Fortunately, the process is exactly the same.

2.1 Multiplication

Let's consider the equation

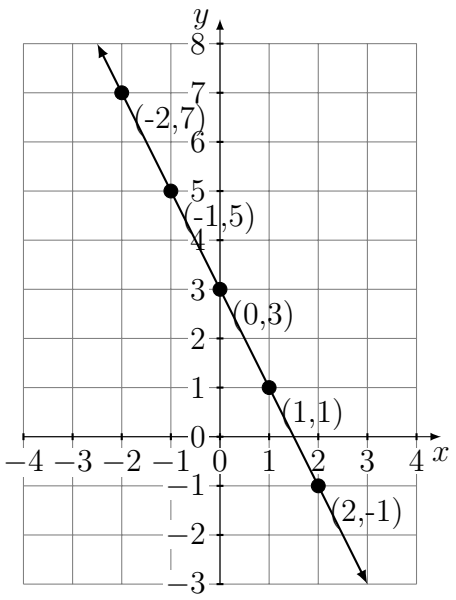
$$y = -2x + 3$$

Now, we have two variables which can represent many numbers, so lets make a table to organize the possibilities like we did before.

x	$-2x + 3 = y$	(x, y)
-2	$-2(-2) + 3 = 4 + 3 = 7$	(-2, 7)
-1	$-2(-1) + 3 = 2 + 3 = 5$	(-1, 5)
0	$-2(0) + 3 = 0 + 3 = 3$	(0, 3)
1	$-2(1) + 3 = -2 + 3 = 1$	(1, 1)
2	$-2(2) + 3 = -4 + 3 = -1$	(2, -1)

Now that we know a few of the possible values for x and y, we can graph the points just like we did before. Our steps are the same:

1. Choose a value for x.
2. Evaluate the equation to find out the value of y.
3. Write the ordered pair.
4. Graph the line formed by the ordered pairs.



2.2 Multiplication 2.0

What if instead of multiplication by a whole number x is multiplied by a fraction? Consider the equation

$$y = \frac{1}{3}x - 3$$

What if we choose $x = 1$? Then we have

$$y = \frac{1}{3}(1) - 3$$

$$y = \frac{1}{3} - 3$$

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

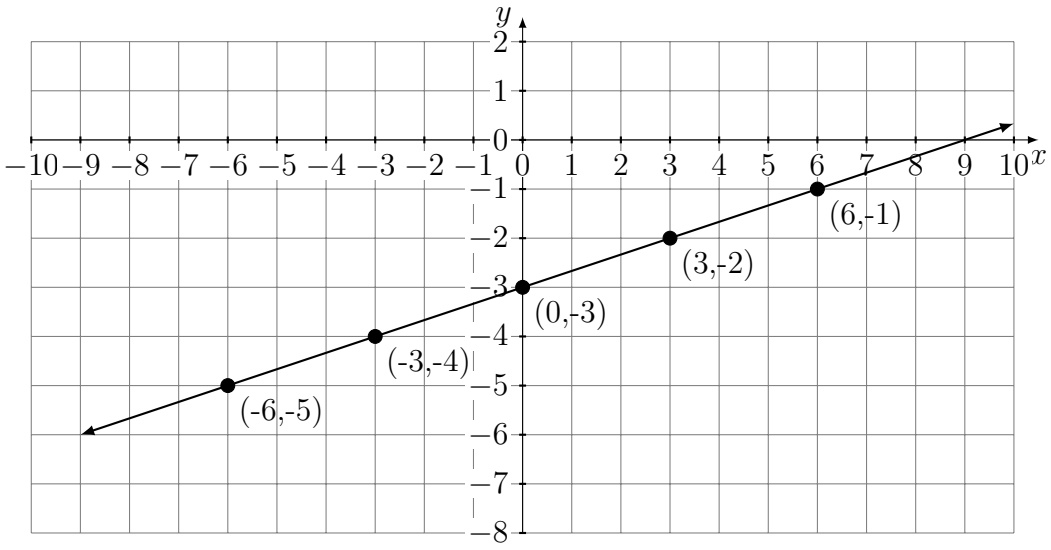
which is not an integer and would be difficult to graph. How can we make this easier to graph?

In this case, we have $\frac{1}{3}x$ or $\frac{x}{3}$. What is another way we can write $\frac{x}{3}$? Recall that a fraction bar can be rewritten as a division sign, so we are really dealing with $x \div 3$.

In order to get integers to graph, let's choose values for x which are easily divisible by 3.

x	$\frac{1}{3}x - 3 = y$	(x, y)
-6	$\frac{1}{3}(-6) - 3 = -2 - 3 = -5$	(-6, -5)
-3	$\frac{1}{3}(-3) - 3 = -1 - 3 = -4$	(-3, -4)
0	$\frac{1}{3}(0) - 3 = 0 - 3 = -3$	(0, -3)
3	$\frac{1}{3}(3) - 3 = 1 - 3 = -2$	(3, -2)
6	$\frac{1}{3}(6) - 3 = 2 - 3 = -1$	(6, -1)

Now we have integer **coordinates** which are easily graphed.



When we are multiplying by a fraction (i.e. dividing) the steps we take do not change. However, we can make the calculations and graphing easier by choosing our values for x carefully.

2.3 Instructional Video

Log on to Google Classroom and watch the Instructional video for Tuesday.

3 Graphing Nonlinear Equations

Up until today, all of the equations we have graphed have been *linear*, that is they formed straight lines on the coordinate plane. Today we are going to look at a *nonlinear* equation.

3.1 Exponent Review

Recall that the **exponent** of a number tells us how many of that number we are multiplying together.

Ex.

$$8^4$$

$$8 \times 8 \times 8 \times 8$$

$$64 \times 64$$

$$4,096$$

Evaluate the following expressions:

1. 4^3
2. 15^2

3.2 Parabolas

Let's consider the equation

$$y = x^2$$

which can also be written as

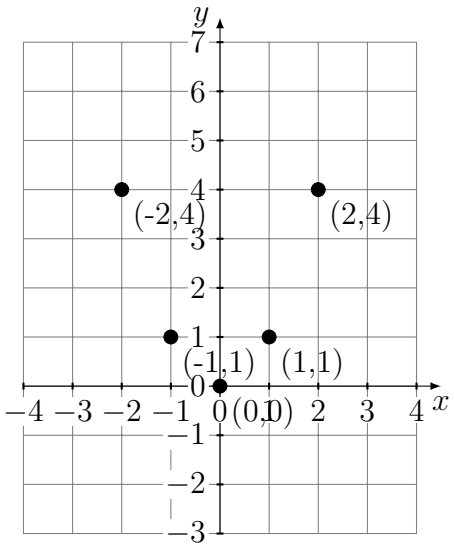
$$y = x \cdot x$$

Our equation has two variables just like before, so let's try choosing values for x.

x	$x \cdot x = y$	(x, y)
-2	$-2(-2) = 4$	(-2, 4)
-1	$-1(-1) = 1$	(-1, 1)
0	$0(0) = 0$	(0, 0)
1	$1(1) = 1$	(1, 1)
2	$2(2) = 4$	(2, 4)

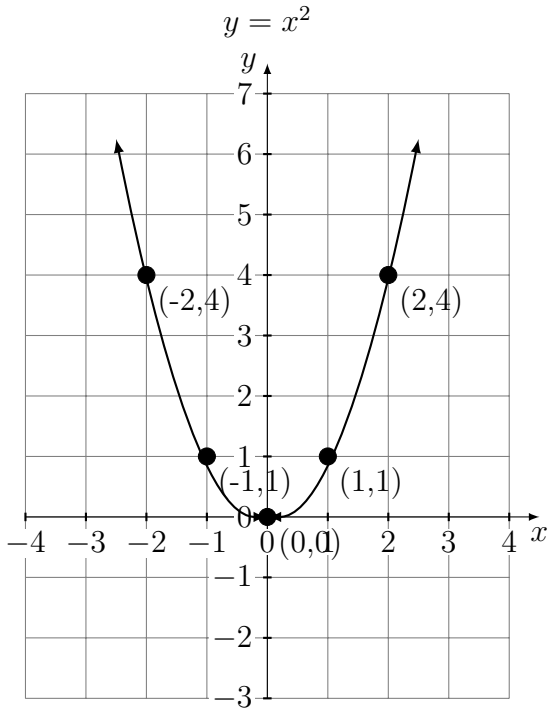
What do you notice about the different values for x versus the different values for y?

This becomes more obvious when we graph the points on the coordinate plane.



Looking at the graph we can see that although our values of x are both positive and negative, all of the y values are positive. Why is this the case? Well consider what happens if we square a number. Any positive number, like 3, will stay positive. $3 \cdot 3 = 9$ If we a square a negative number, then we also get a positive number. Two values for x will give us the same value of y.

When we graph this equation on the coordinate plane it forms a curve called a *parabola*.



In this case, we followed the same steps and ended up with an entirely different type of graph!

3.3 Linear vs. Nonlinear

What makes the two graphs take different shapes? It turns out that the exponent on x will change the shape of the graph. Any equation with x will form a straight line and any equation with x^2 will form a parabola. An equation with x^3 will form a different shape altogether!

Name_____ Date _____

Review – Chapter 11

Watch Thursday's video on Google Classroom

Complete the table.

integer	*opposite*	*absolute value*
-12		
4		
-8		

Write $<$ or $>$ in the blank to make a true statement.

4) -12 _____ -10 5) 4 _____ -8

Find each sum.

6) $-6+13$ 7) $8+(-11)$ 8) $-4+(-4)$

Adding a negative number is the same as _____ a positive number.

Find the difference.

9) $-16-8$ 10) $4-10$ 11) $-16-(-18)$

Subtracting a negative number is the same as _____ a positive number.

Perform the indicated operation.

12) -4×6

13) $10 \times (-10)$

14) $-3 \times (-25)$

15) $-8 \times (-3) \times (-2)$

16) $-57 \div 3$

17) $-108 \div (-12)$

If the number of negative factors is even, the product is _____.

If the number of negative factors is odd, the product is _____.

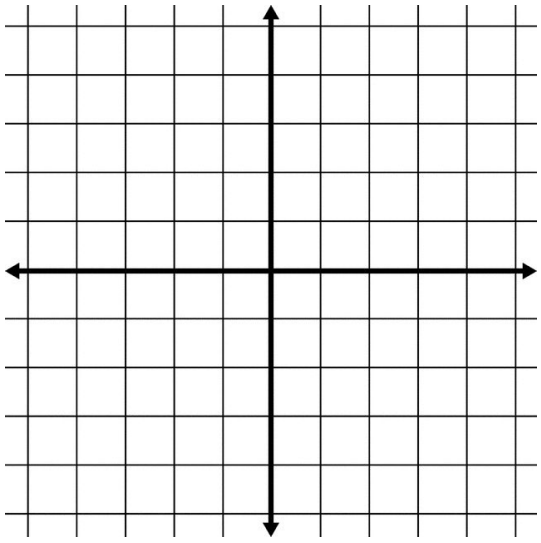
Solve each equation. Show your work!

18) $y + 9 = 4$

19) $x - (-7) = -19$

20) $\frac{1}{-5}n = -4$

Use the grid below for Exercises 21 and 22.



21) Graph and label each ordered pair.
$(-1, 3),\ (-1, 0),\ (2, -2)$

22) Graph $y = 2x - 1$.
Use values of x from -1 to 2.

Define and give an example of the following terms:

Negative number:

opposites:

absolute value:

whole number:

integer:

rational number:

irrational number:

real number:

coordinate plane:

x-axis:

y-axis:

origin:

ordered pair:

coordinates:

function: