Chapter 4 Student Success Sheet (SSS)

Domain, Functions, and Slope

Olathe East High School – Intermediate Algebra

Name:_____

Hour: _____

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"Success means having the courage, the determination, and the will to become the person you believe you were meant to be."

George Sheehan

Concept #	What we will be learning…	Mandatory Practice
1	Identifying coordinates and plotting points; identify quadrant of resulting point	Practice Quiz 1
2	Finding domain and range of relations and functions (given ordered pairs)	Practice Quiz 2
3	Identifying functions using table/ordered pairs	Practice Quiz 3
4	Identifying functions using vertical line test	Practice Quiz 4
5	Identifying rate of change given table	Practice Quiz 5
6	Identifying rate of change given graph or word problem	Practice Quiz 6
7	Finding slope given graph	Practice Quiz 7
8	Finding slope given points; identifying type of line (uphill positive, downhill negative, horizontal zero, vertical undefined)	Practice Quiz 8

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#1 Identifying coordinates and plotting points. Identify quadrant of resulting point.

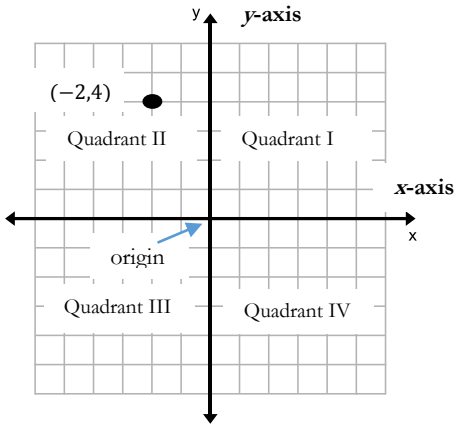
An **ordered pair** of numbers identifies the location of a point. These numbers are The **coordinates** of the point on the graph. Point *B* has coordinates $(-2,4)$.

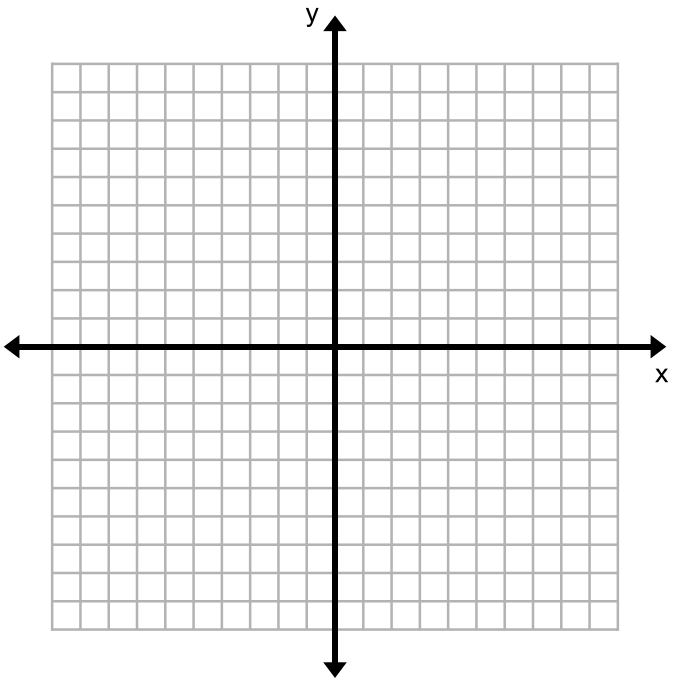
$(-2,4)$

***x*-coordinate** ***y*-coordinate**

The *x*-coordinate tells you how far to move right (positive) or left (negative) from The origin. The *y*-coordinate tells you how far to move up (positive) or down (negative) from the origin.

Two number lines that intersect at right angles form a **coordinate plane**. The Horizontal axis is the ***x*-axis** and the vertical axis is the ***y*-axis**. The axes intersect At the **origin** and divide the coordinate plane into four sections called **quadrants**.





x-value	*y*-value	ordered pair	quadrant
3	-7	$(3,-7)$	IV

#2 Finding domain and range of relations and functions (given ordered pairs).

A relation is a set of ordered pairs. The (age, height) ordered pairs below form a relation.

Giraffe Heights

Age (years)	18	16	20	14
Height (meters)	4.0	4.5	5.5	5.0

Write the given information as ordered pairs.

Write the given information in a *t*-chart.

x	y

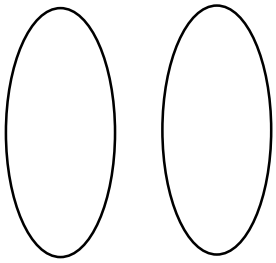
Write the domain and range for the given information.

D: { }

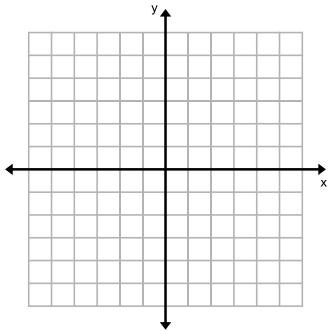
R: { }

The **domain** of a relation is the set of the first coordinates. The **range** of a relation is the set of the second coordinates. Also, write the data in numerical order.

Write the given information in a Mapping Diagram.



Plot the ordered pairs on a graph (estimate large numbers).



Calories Per Serving of Some Common Foods

Food	Grams of Fat	Number of Calories
Whole Milk	8	150
Chicken	4	90
Corn	1	70
Ground Beef	10	185
Eggs	6	80
Ham	19	245
Broccoli	1	45
Cheese	9	115

Write the given information as ordered pairs.

Write the given information in a *t*-chart.

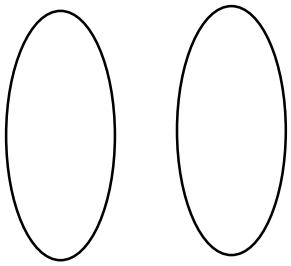
x	y

Write the domain and range for the given information.

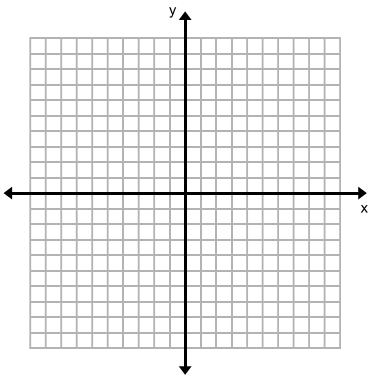
D: { }

R: { }

Write the given information in a Mapping Diagram.



Plot the ordered pairs on a graph (estimate large numbers).



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Iguanas

Age (years)	Length (inches)
2	30
4	37
3	31
5	45
4	40

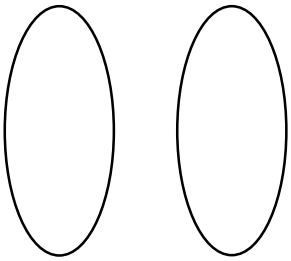
Write the given information as ordered pairs.

Write the given information in a *t*-chart.

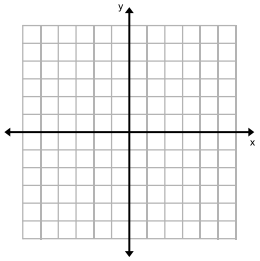
x	y

Write the domain and range for the given information.

Write the given information in a Mapping Diagram.



Plot the ordered pairs on a graph (estimate large numbers).



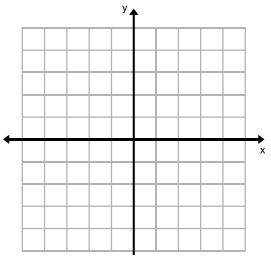
#3 Identifying functions using table/ordered pairs.

A relation that assigns to each value in the domain exactly one value in the range is called a function.

We can identify functions in two ways:

1. **By using a m_____ d_____ and Looking for "_____."**

x	y
-1	4
2	3
4	-1
-1	-2

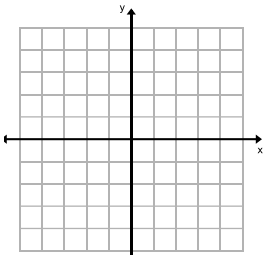


Mapping Diagram:

This relation **IS** or **IS NOT** a function because

_____
_____
_____
_____.

x	y
-4	1
1	3
4	0
1	-2

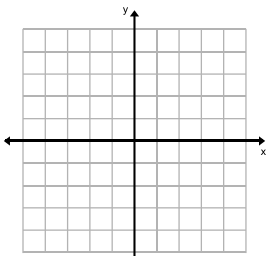


Mapping Diagram:

This relation **IS** or **IS NOT** a function because

_____
_____
_____
_____.

x	y
2	-4
-4	0
-2	3
3	-1



Mapping Diagram:

This relation **IS** or **IS NOT** a function because

_____
_____
_____
_____.

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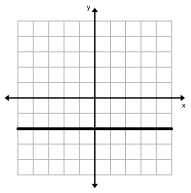
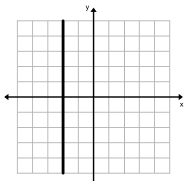
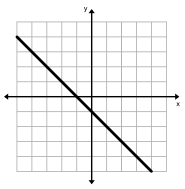
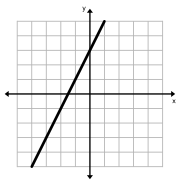
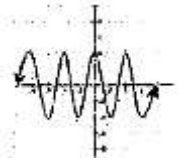
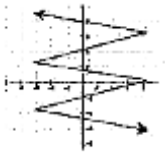
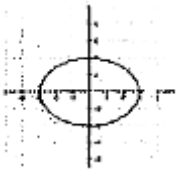
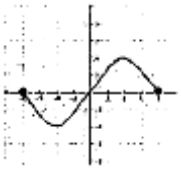
#4 Identifying functions using the Vertical Line Test.

2. By using a g_____ and the V_____ L_____ T____ (VLT) Use the vertical line test to decide if the graph represents a function. Write your answer in a sentence.	 This relation IS or IS NOT a _____ because _____ _____ _____.	 This relation IS or IS NOT a _____ because _____ _____ _____.	 This relation IS or IS NOT a _____ because _____ _____ _____.	 This relation IS or IS NOT a _____ because _____ _____ _____.
 This relation IS or IS NOT a _____ because _____ _____ _____.	 This relation IS or IS NOT a _____ because _____ _____ _____.	 This relation IS or IS NOT a _____ because _____ _____ _____.	 This relation IS or IS NOT a _____ because _____ _____ _____.	 This relation IS or IS NOT a _____ because _____ _____ _____.

#5 Identifying Rate of Change Given Table.

Cost of Renting a Computer	
Number of Days	Rental Charge
1	$60
2	$75
3	$90
4	$105
5	$120

x	y
1	12
2	15
3	18
4	21
5	24
6	27

x	y
-2	3
-1	1
0	-1
1	-3

Time	Height
0	100
1	90
2	80
3	70
4	60

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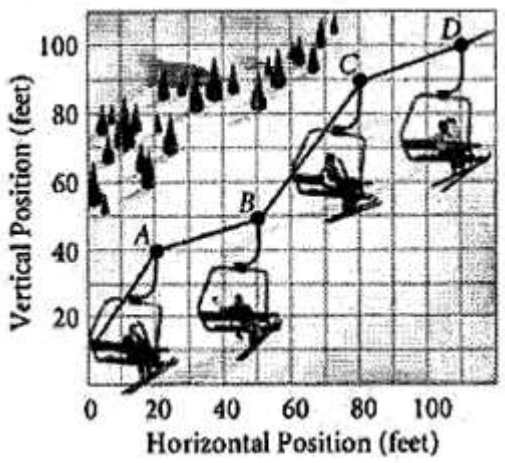
x | y −3 | 10 −2 | 7 −1 | 4 0 | 1 1 | −2 2 | −5		Make your own…	

#6 Identifying rate of change given graph or word problem.

When identifying rate of change on a graph, it is important to notice the:

- **U_____ on both the *x*-axis and *y*-axis**
- **S_____ on both the *x*-axis and *y*-axis**



A to B?	**B to C?**	**C to D?**
A to C?	**A to D?**	**B to D?**

1. Ladainian Tomlinson rushed for 120 yards on 30 *carries*. How many yards did LT get per carry?

_____ yards per _____*carries* REDUCES TO _____ yards per ____1____ *carry*

2. 100 homecoming tickets were sold in 2.5 *hours*. How many tickets were sold per hour?

_____ tickets per _____ *hours* REDUCES TO _____ tickets per ____1____ *hours*

3. You can run 3 miles in 45 *minutes*. How long will it take you to run 5 miles?

_____ miles per _____ *minutes* EXPANDS TO _____5_____ miles per _____ *minutes*

4. Jim decided to drop out of school to pursue a career at McDonalds. He made 55 dollars in *10 hours*. Bill decided to finish high school and college so he could work for a sweet robot making company. He made 50 dollars in *2 hours*. How much do Jim and Bill each make an hour? Would you rather follow Jim's or Bill's path?

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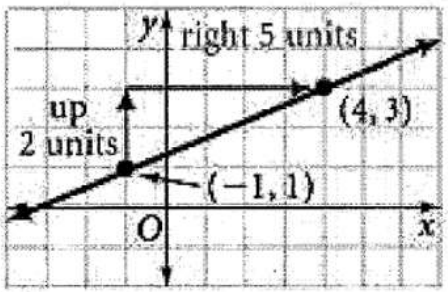
5. The ninja drop kicked <u>120 pirates</u> in the head in *one minute*. The pirate drop kicked <u>4808 ninjas</u> in *three minutes*. Who would you rather have on your drop kicking team – the ninja or the pirate? Why?

6. Staples sells <u>6 crayons</u> for *$1.20.* Office Depot sells <u>7 crayons</u> for *$1.40.* Which is the better buy?

#7 Finding slope given graph.

Find the slope of the line.



$$slope = \frac{rise}{run} = \frac{2}{5}$$

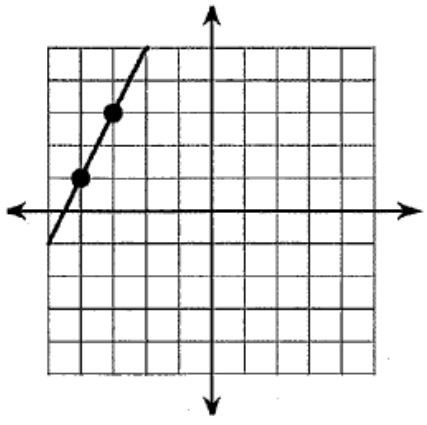
The slope of the line is $\frac{2}{5}$.

Rate of Change .... Slope!

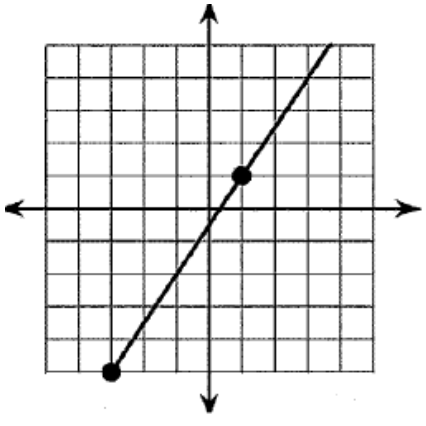
Slope ... Rise over Run!

Rise over run ... _____ (coming soon!)

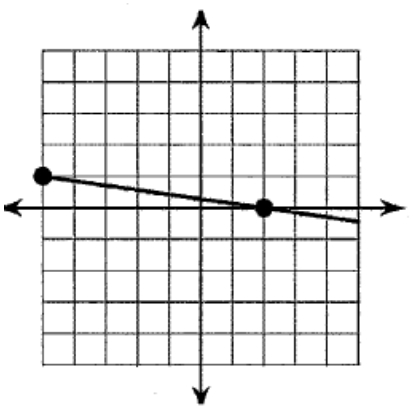
1.



2.



3.



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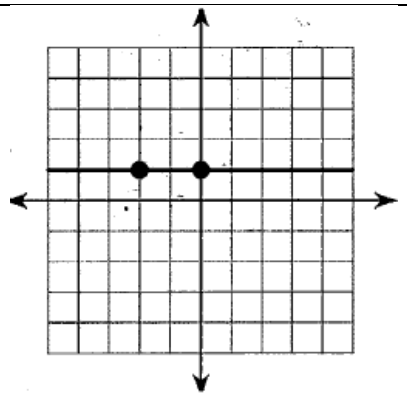
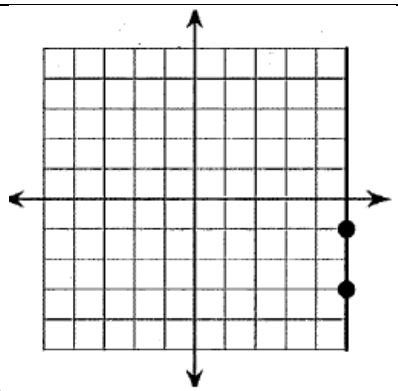
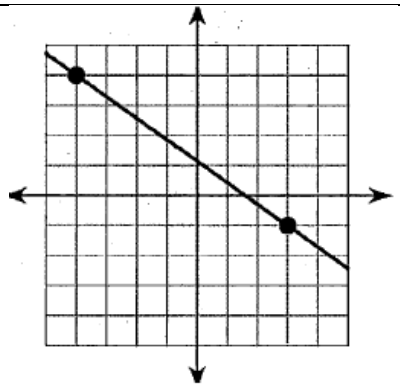
4. 

5. 

6. 

#8 Finding slope given points; identifying type of line

(uphill positive, downhill negative, horizontal zero, vertical undefined)

Rate of Change .... Slope!

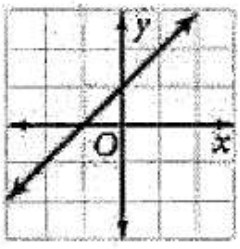
Slope ... Rise over Run!

Rise over run ... _____

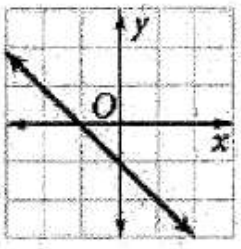
Formula **Slope**

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}, \text{ where } x_2 - x_1 \neq 0$$

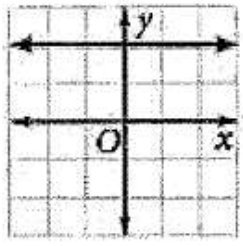
Summary **Slopes of Lines**



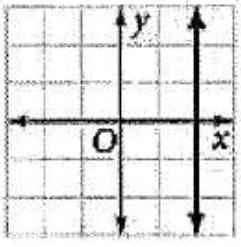
A line with positive slope slants upward from left to right.



A line with negative slope slants downward from left to right.



A line with a slope of 0 is horizontal. .



A line with an undefined slope is vertical.

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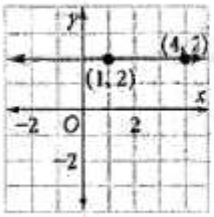


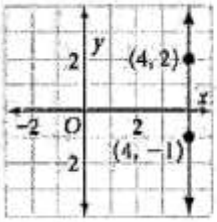
$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$= \frac{2 - 2}{4 - 1}$ Substitute (4, 2) for (x_2, y_2) and (1, 2) for (x_1, y_1).

$= \frac{0}{3}$ Simplify.

$= 0$

The slope of the horizontal line is 0.



$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

$= \frac{2 - (-1)}{4 - 4}$ Substitute (4, 2) for (x_2, y_2) and (4, −1) for (x_1, y_1).

$= \frac{3}{0}$ Simplify.

Division by zero is undefined. So, the slope of the vertical line is undefined.

7) (13, 14), (13, −10)	Slope = _____ Type of line:	8) (−15, −6), (8, −15)	Slope = _____ Type of line:
9) (1, 2), (−19, −18)	Slope = _____ Type of line:	10) (−3, −19), (12, 5)	Slope = _____ Type of line:
11) (13, −11), (−6, 3)	Slope = _____ Type of line:	12) (−6, 4), (3, 4)	Slope = _____ Type of line:
13) (9, 19), (9, −16)	Slope = _____ Type of line:	14) (12, −18), (−10, −18)	Slope = _____ Type of line:
15) (−4, −2), (16, 9)	Slope = _____ Type of line:	16) (12, 6), (−16, 16)	Slope = _____ Type of line:

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