Name: _____ Due Date:__Mon 4/29__ HW# ____

SGL 8th Grade Math Circle your Class: 801 802 803 804 805

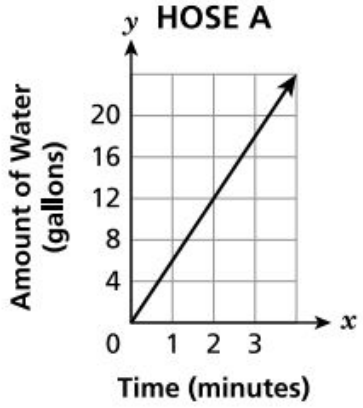
Homework 19: April Vacation

Self-Evaluation: ____ out of 10 Teacher Evaluation: ____ out of 10

HW Rubric	2 points	4	6 points	8	10 points
• All problems complete? • All annotation and work shown? • Is math accurate? • **Subtract 2 points for each week late.**	Very few Very few Less than 50%		Some Some About 75%		All complete All shown 90-100%

1.

Charles needs to fill a large fish tank with water using a hose. He has two hoses from which to choose. Water flows through each hose at a constant rate. The graph below shows the amount of water, in gallons, that flows through Hose A based on the number of minutes used.



A total of 110 gallons of water can flow through Hose B in 10 minutes. Which hose has a faster water flow rate, in gallons per minute, and what is that rate?

Hose A:	minutes	0	1	2	3	4	5	6
	gallons							

Hose B:	minutes	0	1	2	3	4	5	6	7	8	9	10
	gallons											

What is the rate of change for A and B? Which is greater?

2. **A Function** has only one output (y) for each input (x). If any input (x) matches more than one output (y), it is not a function.

In each table, x represents the input value and y represents the output value. Which table does **not** represent a function of x?

A

x	y
0	0
1	1
2	2
3	3

C

x	y
0	3
1	3
2	3
3	3

B

x	y
3	0
2	1
1	2
0	3

D

x	y
3	0
3	1
3	2
3	3

A) Kimarley claims that A is correct. Why is that a function?

B) Dinneer claims that B is correct. Why is that a function?

C) Kahlil claims that C is correct. Why is that a function?

D) Jailyn claims that D is correct. Why is that **not a function**?

3. In an equation y = m(x) + b, the m is the slope or rate of change. The m is always multiplied by x. The Y-Intercept, or starting point, is called b and it is the number that is added or subtracted.

In city W, the average cost for a gym membership is given by the equation $y = 34.99x + 49$, where y is the total cost, in dollars, for x months of membership. What is the meaning of the y-value when $x = 1$?

A the average sign-up fee for a gym membership

B the average monthly charge for a gym membership

C the average total cost for the first month of a gym membership

D the average total cost for the first two months of a gym membership

A) Dylan claims A is correct. Why is that false? Which number is the starting point (or y-intercept)?

B) Noah claims B is correct. Why is that false? Which number is the rate of change (or slope)?

C) Jacob claims C is correct. Why is that true? What would happen if you substituted x = 1 into the equation?

D) Shaniya claims D is correct. Why is that false? If x = 2, what would be the total cost for 2 months?

4. In Scientific Notation, there is a **First Factor** and a **Power of Ten.** To find how many times bigger a number is, we divide the first factors and we subtract the powers of ten. A final answer should have a first factor between 1 and 10. For example if you have $183.0\,x\,10^4$, the first factor is greater than 10, so we adjust our answer to $1.830\,x\,10^6$ by moving the decimal and changing the exponent.

City X has a population of 3×10^5 and City Y has a population of 6×10^6. Which statement correctly describes the relationship between the populations of City X and City Y?

A The population of City Y is 2 times the population of City X.

B The population of City Y is 20 times the population of City X.

C The population of City X is 300,000 less than the population of City Y.

D The population of City X is 3,000,000 less than the population of City Y.

A) Jepherson claims that A is correct. Why is that false?

B) Dayne claims that B is correct. Why is that true?

C) Rodolfo claims that C is correct. Why is that false?

D) Nalimata claims that D is correct. Why is that false?

5. To add or subtract in Scientific Notation, you must have the same exponent. To adjust the exponent of 3 down by 1 in $(6.0\ x\ 10^3)$, we must also move the decimal 1 time to make the First Factor bigger. Once both numbers have an exponent of 2, we can add the First Factors of 4.5 and 60.

Which expression is equivalent to $(4.5 \times 10^2) + (6.0 \times 10^3)$ and written in scientific notation?

A 1.05×10^6

B 2.7×10^6

C 6.45×10^3

D 10.5×10^5

A) Isaiah claimed that A was correct. Why is that false?

_____

B) Dennis claimed that B was correct. Why is that false?

_____

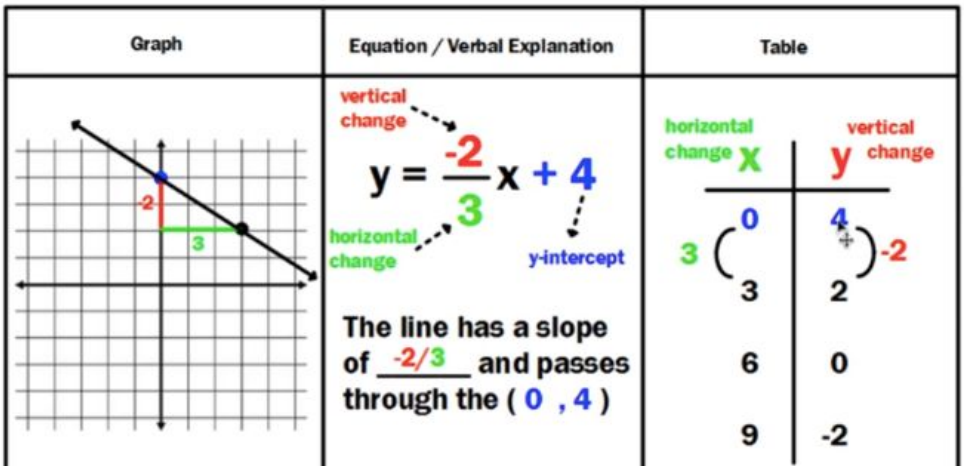
C) Josaiah claimed that C was correct. Why is that true?

_____

D) Ryan claimed that D was correct. Why is that false?

_____

6. To compare the slope and the Y-intercept in a graph, an equation, or a table, here are some clues:



In this example, the Y-Intercept = +4 and the Slope = $\frac{-2}{3}$

A. Where do we find the y-intercept in the graph?

_____

B. Where do we find the y-intercept in the equation?

_____

C. Where do we find the y-intercept in the table?

D. Where do we find the slope in the graph?

E. Where do we find the slope in the equation?

F. Where do we find the slope in the table?

7.

Functions W and Z are both linear functions of x.

Function W

$y = -\frac{1}{16}x + 30$

Function Z

x	0	1	2	3
y	15.8	15.76	15.72	15.68

Which statement comparing the functions is true?

A The slope of Function W is equal to the slope of Function Z.

B The slope of Function W is less than the slope of Function Z.

C The y-intercept of Function W is equal to the y-intercept of Function Z.

D The y-intercept of Function W is less than the y-intercept of Function Z.

A) X'Zeria claims that A is correct. What are the slopes for Function W and Function Z?

B) Safiyyah claims that B is correct. Why is that true?

C) Isaiah claims that C is correct. What are the y-intercepts for Function W and Function Z?

D) Je'An claims that D is correct. Why is that false?

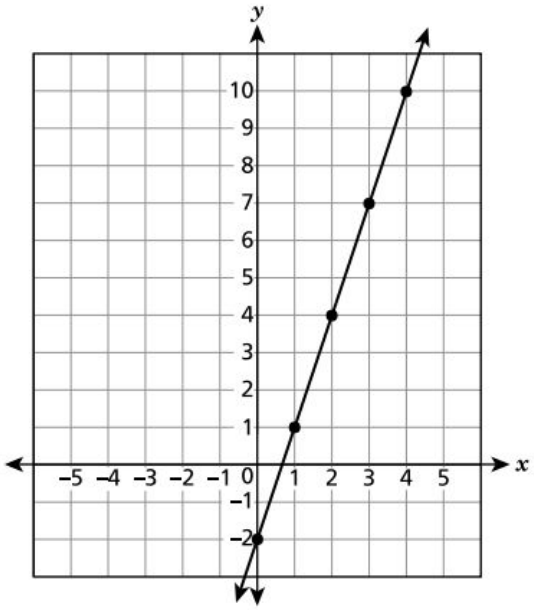
8.

The table and graph shown below each represent a function of x.

FUNCTION A

x	y
1	5
2	7
3	9
5	13
6	15

FUNCTION B



Which function, A or B, has a greater rate of change? Be sure to include the values for the rates of change in your answer.

Explain your answer.

Function A: Annotate with arrows to show change in X and change in Y. What is the rate of change?

Function B: Annotate with arrows to show rise and run. What is the rate of change?

Which Function has a greater rate of change? Why?

9.

---Strategy 1: Use distribution, combine like terms, and get the variable alone on one side

---Strategy 2: substitute x = 0 and see if both sides are equal, then substitute x = 1 and see if both sides are equal.

An equation is shown below.

$$3(x-2)+7x=\frac{1}{2}(6x-2)$$

How many solutions, if any, does the equation have?

Show your work.

A) Infinite solutions (all real numbers)
B) No Solution
C) One Solution: x = ____

10. If you have 2 equations (called a system), you can choose any of 3 methods:
---try out each answer by plugging in an X and a Y value to see if it makes each equation true
---set the equations equal to each other and solve for one variable
---try to add/subtract the 2 equations together to eliminate one variable.

A system of equations is shown below.

$$5x + 2y = -15$$
$$2x - 2y = -6$$

What is the solution to the system of equations?

A $(-3, 0)$

B $(0, -3)$

C $(-3, 6)$

D $(6, -3)$

A) Audrey claims that A is correct. Why is that true? (show work here)

B) Jordan claims that B is correct. Why is that false? (show work here)

C) Angelique claims that C is correct. Why is that false? (show work here)

D) Kahlil claims that D is correct. Why is that false? (show work here)

11. If you have 2 equations (called a system), you can choose any of 3 methods:
    ---try out each answer by plugging in an X and a Y value to see if it makes each equation true
    ---set the equations equal to each other and solve for one variable
    ---try to add/subtract the 2 equations together to eliminate one variable.

    At a local basketball game, all tickets are the same price and all souvenirs are the same price. Mr. Smith bought 2 tickets to this basketball game and 1 souvenir for a total of $17.25. Ms. Lockhart bought 5 tickets to the same game and 2 souvenirs for a total of $42.00. How much was a ticket to this game?

    A $2.25

    B $7.50

    C $8.50

    D $9.75

Before you can choose a strategy, you need to choose a variable for tickets and a variable for souvenirs.

The letter ___ will represent tickets

The letter ___ will represent souvenirs

Then you must write 2 equations using those variables:

Mr. Smith: _____ + _____ = _____

Ms. Lockhart: _____ + _____ = _____

Finally, choose one of the 3 strategies above. Show work here:

Final Answer: _____