

G-GPE.4 and G-GPE.6 (18 Released #43 and #49 MC DOK 2 SKILL/CONCEPT) (Geometry Approx 12% -5)

Day 1- Optional (you have no option,) test points daily HW problems.

WORK MUST BE NEAT, LINES STRAIGHT (USING A RULER,) AND ACCURATE. For your generated scenario, each new sentence should start with a capital letter and end with correct punctuation. (period or question mark)

Directions:

- Make 4 graphs (coordinate planes,) using 1 sheet of graph paper. Two graphs should be on the front and two graphs should be on the back. *See example*

- Plot 1 set of points on each of the graphs.

- Draw vertical and horizontal lines that form the sides of a right triangle. Connect the endpoints to make the hypotenuse using dashed lines.

- Count and label the sides of the right triangle.

- a. Set up the slope of the hypotenuse of the right triangle
b. Set up the distance of the hypotenuse using the Pythagorean Theorem. (DO NOT SIMPLIFY)
c. Set up the midpoint of the two endpoints of the hypotenuse.

- Using real life scenarios create one word problem that involves distance, midpoint, or slope.

Example Scenario 1- (Midpoint.) Greensboro is located on a map at the coordinate (4,2), Spartanburg is located on a map at the coordinate (8,4); Charlotte is the middle of Greensboro and Spartanburg. Find the coordinates on the map for Charlotte.

Example Scenario 2- (Distance.) Greensboro is located on a map at the coordinates (4,2), Spartanburg is located on a map at the coordinates (8,4). How far, in units, is Greensboro from Spartanburg?

Example Scenario 3- (Slope.) Mark makes \$40.00 in 2 hours and \$100.00 in 5 hours. Set up a ratio that determines how much money Mark makes in 1 hour. USE $\frac{\text{dollars}}{\text{hours}}$

Example 1

$(4, 2)$ $(-5, 7)$

a)

(rise)
(run)

Vertical Distance 5

Horizontal Distance 9

Hypotenuse -

slope $-\frac{5}{9}$

b)

Distance $\sqrt{(5)^2 + (9)^2}$

c)

Midpoint $\left(\frac{4-5}{2}, \frac{2+7}{2}\right)$

Problems

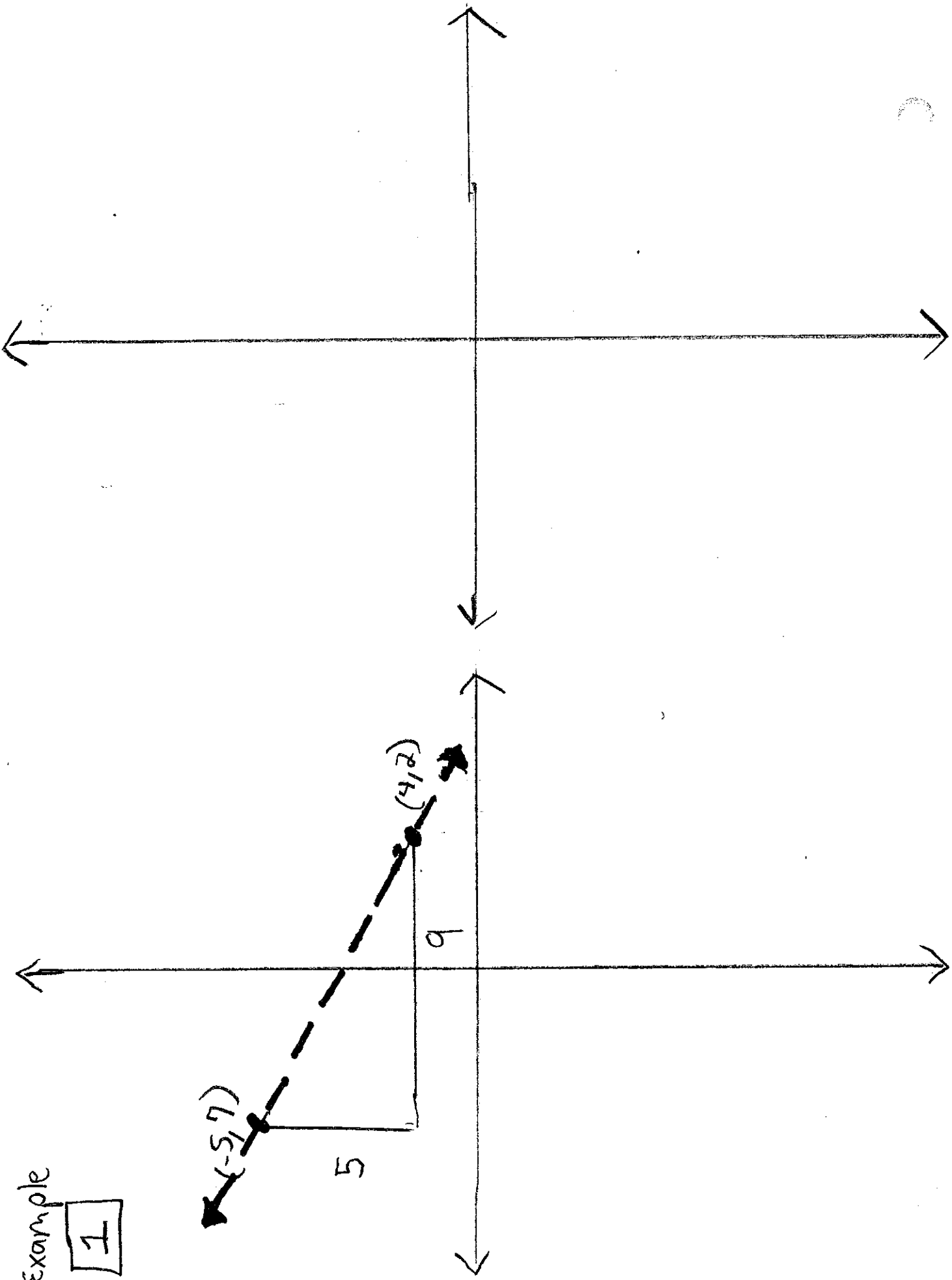
① $(1, 5)$ $(7, 11)$ ④ $(0, 8)$ $(8, 2)$

② $(-4, -2)$ $(0, 5)$

③ $(-2, 0)$ $(4, 8)$

Example

1



F-IF.2 (18 Released #9, #28, and #41 GRID/ DOK 1 Recall) (Functions Approx 32%-36% -17)

Day 2- Optional (you have no option,) test points daily HW problems.

Create the equation in slope in slope intercept form that models the given situation. Provide the meaning of each variable and number in your slope intercept equation. SET UP to find the solution associated with each scenario. DO NOT ANSWER.

Example 1: The cost, in dollars, to purchase doughnuts by the dozen is \$5.00 per dozen plus a flat tax of \$3.00. Create the equation to model the total cost $C(d)$, in terms of a dozen doughnuts d .

$$C(d) = \$5.00d + \$3.00 \quad \text{LOOKS LIKE } y = mx + b \quad \text{or } C = 5d + 3$$

$C(d)$ is total cost \$5.00 is cost per dozen d is number of dozens purchased \$3.00 is flat tax

a.) If Jay spent \$58.00 on doughnuts how many single doughnuts did he purchase?

Set Up: $\$58.00 = \$5.00d + \$3.00$ and Solve equation for d .

Multiply value you found for d by 12 because there are 12 doughnuts in a dozen and we want how many SINGLE doughnuts were purchased?

SCENARIO 1. Coach Brim and the girls basketball team are selling raffle tickets for \$5 each to raise money to purchase shoes for each girl. The team decided to raffle off 3 prizes. The prizes are 1st place \$100.00 gift card, 2nd place a \$70.00 gift card, and 3rd place a \$30.00 Gift card. Write an equation in slope intercept form to model the money the team makes after purchasing the prizes and selling x amount of raffle tickets. Label each variable and number in the equation with its meaning from the scenario.

Part B: How many tickets must be sold to pay for the prizes, but earn no money? SET UP EQUATION TO FIND ONLY.

SCENARIO 2. The Cardinal band has decided to have a car wash to raise money for new band uniforms. The supplies for the car wash included buckets, water hoses, sponges, and car wax. The total amount spent on supplies was \$100.00. The cost of each car washed will be \$10.00. Write the equation in slope intercept form that models the profit that the band will make after paying for supplies. Label each variable and number in the equation with its meaning from the scenario.

Part B: How many cars must be washed to pay for supplies and make a profit of \$2000.00 for new uniforms? (Set up the equation to solve only. DO NOT SOLVE!)

SCENARIO 3 The Lady Cardinal Cheerleaders are headed to the state championship at Chapel Hill. Mrs. Kennedy has decided to charter a bus to take students and parents along to show support. The cost of the bus is \$500 plus a \$200 driver fee. The school charges \$20.00 for each person to ride the bus. Write an equation in slope intercept form that represents the profit the school will make after money from riders have been collected, and the bus has been paid for. Label each variable and number in the equation with its meaning from the scenario.

Part B: If only 20 people decided to sign up how much profit would the school make? (Set up the equation only, DO NOT SOLVE.)

SCENARIO 4- CREATE YOUR OWN SCENARIO THAT CAN BE MODELED IN SLOPE INTERCEPT FORM. CREATE YOUR EQUATION IN SLOPE INTERCEPT FORM AND DESCRIBE WHAT EACH VARIABLE AND NUMBER REPRESENTS IN YOUR SITUATION. Make one question that can be answered using your equation. DO NOT SOLVE IT.

A-CED.1 (18 Released #24Grid, #29Grid, and #33MC DOK 2 Skill/concept) (Algebra Approx 36%-40% -19)

Day 3- Optional (you have no option,) test points daily HW problems.

Example 1. Cynthia scored a 70, 55, 90, and 60 on her first 4 formal grades. What score does she need to make on her 5th formal grade to have a formal average of 70%?

Set Up $\frac{\text{Formal 1} + \text{Formal 2} + \text{Formal 3} + \text{Formal 4} + \text{Formal 5}}{\text{Total Number of Formals}} = \text{Formal Average (or desired formal average)}$

So we have $\frac{70+55+90+60+X}{5} = 70$ Which can be written as $275 + x = 70(5)$ OR $275 + x = 350$

Solving the equation produces $x = 75$. Cynthia has to make a 75 on her 5th formal grade to have a formal average of 70%

Set up the following 4 problems. SHOW 3 BOLD SET UPS FROM ABOVE. DO NOT ANSWER.

Question 1. Naomi has scored an 85, 70, and a 55 on her first 3 Unit Test. What must Naomi make on her Unit 4 Test to have an average equal to 80%?

Question 2. Zen has scored a 70, 90, 85, and 75 on the first four quizzes. What must Zen score on Quiz 5 to have a quiz average equal to 85%?

Question 3. Charles has 6 weekly exit ticket grades of 80, 50, 30, 100, 90, and 100. What grade must Charles make on his 7th weekly exit ticket to have an exit ticket average equal to 80%?

Question 4. Harlem has warm up grades of 100, 100, 0 and 0. What grade must Harlem make on his 5th warm up to have a warm up average equal to 60%

THINK and WRITE: How do you think you could determine the answers to the following questions 1-4 without using the **3 BOLD SET UPS**? Is there a more simple way to find the value? Explain your process in complete NEAT sentences. What would change if the 4 questions read AT LEAST instead of EQUAL?

A-CED.4 (18 Released #12 MC, DOK 1 Recall) (Algebra Approx 36%-40% -19) one literal but helps with isolating variables and writing equations in slope intercept form..

Day 4- Optional (you have no option,) test points daily HW problems.

For each of the literal equations box the indicated variable, write the operations that are performed to the indicated variable on that side of the equal mark. Write the inverse operation associated with each operation listed. DO NOT SOLVE THE EQUATION

Example 1.

$T = 580s + 140p$ Solve for p Operations: 580s is ADDED to p Inverse Operation: SUBTRACT 580s
Operation: 140 is MULTIPLIED to p Inverse Operation: Divide 140

Example 2

$E = mc^2$ Solve for c Operations: m is MULTIPLIED to c Inverse Operation: DIVIDE m
Operation: 2 is the SQUARE of c Inverse Operation: SQUARE ROOT

Questions 1. For $P = 2l + 2w$ Solve for w

Question 2. For $A = \frac{bh}{2}$ Solve for h

Question 3. For $C = 2\pi r$ Solve for r

Question 4. For $2x + 3y = 6$ Solve for y

Question 5. For $4x - 3 = 13$ Solve for x

F-IF.7 (18 Released #1 MC, DOK 2 Skill/Concept) (Functions Approx 32%-36% -17)

Day 5- Optional (you have no option,) test points daily HW problems.

Assigned: Tuesday - 11/13/18

Due: Thursday 11/15/18 at the start of class. NO EXCEPTIONS!

IF THE PRODUCT OF TWO THINGS EQUAL ZERO THEN AT LEAST ONE MUST BE ZERO. IF $AB = 0$ THEN A MUST BE 0, OR B MUST BE 0, OR BOTH.

For the product of the factors, solve for x. List the values as an ordered pair with y as 0. Pick a value for x and plug in the original equation and find a output of y. When you complete each problem you should have 3 ordered pairs.

Example 1. $Y = (x + 2)(x - 3)$ $0 = (x + 2)(x - 3)$ so $0 = x + 2$ and $0 = x - 3$ by solving both equations I get $x = -2$ and $x = 3$

For my third point I chose to plug in 0 for x in the original equation $y = ((0) + 2)((0) - 3)$ so $y = (2)(-3) = -6$

So my 3 ordered pairs are $(-2, 0)$ $(3, 0)$ and $(0, -6)$ If I wanted to view the graph I could plot these 3 points

SHOW SET UP AND WORK FOR EACH OF THE 3 POINTS THAT YOU FIND! SOLVE THE EQUATIONS AND LIST 3 ORDERED PAIRS.

QUESTION #1 $y = (3-x)(4+x)$

QUESTION #2 $y = (x+5)(x+4)$

QUESTION #3 $y = (x - 1)(2 + x)$

QUESTION #4 $y = x(X+6)$

QUESTION #5 YOU MUST RESEARCH THE FOLLOWING TOPIC: "QUADRATIC FUNCTION." What is a quadratic function and how can it be used in real life? (At least 2 sentences. Youtube helps!)

F-LE.1 (18 Released #44 MC, DOK 2 Skill/Concept) (Functions Approx 32%-36% -17)

Day 6- Optional (you have no option,) test points daily HW problems.

Determine if the situation represents a LINEAR ($Y = MX+B$) or a EXPONENTIAL situation. If linear, list the meaning of the SLOPE and Y-INTERCEPT. If exponential, list the INITIAL VALUE and PERCENT OF CHANGE.

Example 1.

- a.) John rents a boat for \$15 per hour; the company requires a deposit of \$50 that will be refunded at the end of the trip.

ANSWER: LINEAR SLOPE = \$15 per hour Y-Intercept = \$50 Fee

- b.) Mary deposit \$1000 in an account that pays 4% interest each year.

ANSWER: EXPONENTIAL INITIAL VALUE = \$1000 PERCENT OF CHANGE = 4%

YOUR PROBLEMS

- A.) The amount of medicine in mg in an initial dose is 100, after 1 day the amount of mg of medicine goes to 90% of the initial dose. How much medicine, in mg, is in the body after 4 days?

B.) A taxi company charges a flat fee of \$7.50. Marco used his credit card to pay for his ride and noticed that his 5-mile trip cost \$12.50. What is the cost per mile for Marco's trip?
- A.) Cierra takes out a student loan for college of \$80,000. The bank charges her an interest rate of 3% per year. How much will Cierra have to pay back over a 10-year period?

- B.) Verizon Charges a monthly fee of \$60 per line plus \$.25 for each minute of call time over 200 minutes. What would be the monthly bill of someone who uses Verizon and has talked 350 minutes?
3. A) The function $v(t) = \$10,000(.78)^t$, represents the value of a car that depreciates after purchased. What is the value of the car after 2 years?
- B.) Gerald puts \$35.00 in his gas tank. Gerald's car gets 30 miles to the gallon and can travel an additional 5 miles with no gas. Write an equation that represents the total amount of miles that Gerald can travel based on the gallons of gas put in the tank.
4. Create one scenario that can be modeled with a linear functions and create one scenario that can be modeled with an exponential function. WRITE THE FUNCTION AFTER CREATING THE SCENARIO $y = mx + b$ and $y = A(1+R)^x$

Day 7- Optional (you have no option,) test points daily HW problems.

The Y-INTERCEPT of a function is the point at which the graph crosses the y-axis, therefore at that point, the x part of the coordinate is zero. For the following functions, we will compare the difference between the two y-intercepts.

Example 1. Determine the y-intercept for each function by either a.) completing a table, b.) plugging in zero for x and getting out a y. or c.) Writing the linear equation in slope intercept form $y=mx + b$ and looking at the b (y-intercept.)

$$F(x) = 2x + 3 \text{ so y intercept} = (0,3) \quad g(x) = 7(2)^x, g(0) = 7(2)^{(0)} = 7 \text{ so y-intercept is } (0,7)$$

The difference between "3" and "7" is "4"

Example 2. Find the y-intercept by plugging in 0 for x and solving for y.

$$2x + 3y = 6$$

$$2(0) + 3y = 6 \text{ By solving for y we get } y = 2 \text{ so y-intercept is } (0,2)$$

$$G(x) = 100\left(\frac{1}{2}\right)^x \text{ So } 100\left(\frac{1}{2}\right)^0 = 100 \text{ so y-intercept for } g(x) \text{ is } (0,100)$$

The difference between "2" and "100" is "98"

YOUR PROBLEM-Find the y intercepts by plugging in zero for x.

1. $F(x) = 2x - 8$

$$g(x) = 2(9)^x$$

Y-intercept for f(x) is _____

y-intercept for g(x) is _____

2.) $3x + 3y = 12$

$g(x) = 400(3)^x$

Y-intercept is _____

y-intercept for $g(x)$ is _____

3.) $-y = 4x + 8$

$-3y = 3x + 12$

y-intercept is _____

y-intercept is _____

4.) $f(x) = 145(8)^x$

$g(x) = 205((2)^x)$

y-intercept for $f(x)$ is _____

y-intercept for $g(x)$ is _____

5.) For questions 1-4 what was the difference in the y- intercepts for each set of the two functions?

1.) Y intercepts were "-8" and "2" so the difference was "10"

2.) Difference is _____

3.) Difference is _____

4.) Difference is _____

Day 8-

The equation of a "LINE" can be written in standard form $Ax + By = C$ or slope-intercept form $y = mx + b$. We can recognize the slope "m" and y intercept "b" if the equation is in slope intercept form, but it's more complicated if the equation is in standard form and we have to SOLVE FOR Y first.

SHORT CUT. **"DO NOT USE WITH INEQUALITIES"** We can go from Standard form to Slope intercept form by solving the literal standard form equation for the variable y. SO FOR $Ax + By = C$

i.) Subtract Ax from both sides $By = -Ax + C$

ii.) Divide both sides (each term,) by B $y = \frac{-A}{B}x + \frac{C}{B}$

so we can see the slope is just $\frac{-A}{B}$ or $\frac{\text{opposite of } A}{B}$

The y intercept is just $\frac{C}{B}$

Examples- Find the slope and the y-intercept from the standard form and use to write the equation in slope intercept form

1.) $2x + 5y = 4$ $A = 2$ $B = 5$ $C = 4$ opposite of A is -2

So Slope is $\frac{-2}{5}$ and y intercept is $\frac{4}{5}$

Equation is $y = \frac{-2}{5}x + \frac{4}{5}$

2.) $-x + y = 4$ $A = -1$ $B = 1$ $C = 4$ opposite of A is 1

So Slope is $\frac{1}{1}$ and y intercept is $\frac{4}{1}$

So equation is $y = x + 4$

YOUR PROBLEMS!

1.) $2x + 3y = 7$ $A = \underline{\quad}$ $B = \underline{\quad}$ $C = \underline{\quad}$ Opposite of A = $\underline{\quad}$

Slope is _____ Y intercept is _____

Equation in slope intercept form is _____

2.) $-2x + 4y = 3$ $A = \underline{\quad}$ $B = \underline{\quad}$ $C = \underline{\quad}$ Opposite of $A = \underline{\quad}$

Slope is _____ Y intercept is _____

Equation in slope intercept form is _____

3.) $x + y = -2$ $A = \underline{\quad}$ $B = \underline{\quad}$ $C = \underline{\quad}$ Opposite of $A = \underline{\quad}$

Slope is _____ Y intercept is _____

Equation in slope intercept form is _____

4.) $-3x + y = -3$ $A = \underline{\quad}$ $B = \underline{\quad}$ $C = \underline{\quad}$ Opposite of $A = \underline{\quad}$

Slope is _____ Y intercept is _____

Equation in slope intercept form is _____

Day 9- Optional (you have no option,) test points daily HW

So far, we have studied 2 types of functions. **“Linear”** functions come in the popular form $y = mx + b$ or standard form $Ax + By = C$, **“Exponential”** Functions come in the form $y = ab^x$. We will soon be studying our 3rd type of function **“Quadratics.”** This will come in the form $Ax^2 + Bx + C = 0$. This assignment will be helpful in finding factors of a quadratic function.

For the quadratic functions list A, B, C, and AC. Find 2 numbers that ADD to give you B and the same two numbers must MULTIPLY to give you AC.

Examples.

1. For $f(x) = x^2 + 8x + 15$ $A = \underline{1}$ $B = \underline{8}$ $C = \underline{15}$ $AC = \underline{(1)(15)}$

$$\begin{array}{r} \underline{\quad 3 \quad} + \underline{\quad 5 \quad} = B \ (8) \\ \underline{\quad 3 \quad} * \underline{\quad 5 \quad} = AC \ (15) \end{array}$$

So the numbers that add to give us 8 and multiply to give us 15 are “3” and “5”

2. For $f(x) = 2x^2 + 7x + 3$ $A = \underline{2}$ $B = \underline{7}$ $C = \underline{3}$ $AC = \underline{(2)(3)}$

$$\begin{array}{r} \underline{\quad 6 \quad} + \underline{\quad 1 \quad} = B \ (7) \\ \underline{\quad 6 \quad} * \underline{\quad 1 \quad} = AC \ (6) \end{array}$$

So the numbers that add to give us 7 and multiply to give us 6 are “6” and “1”

YOUR PROBLEMS:

1. For $f(x) = x^2 - 4x - 5$ A = B = -4 C = -5 AC =

$$\begin{array}{r} \underline{\quad\quad} + \underline{\quad\quad} = B \underline{\quad\quad} \\ \underline{\quad\quad} * \underline{\quad\quad} = AC \underline{\quad\quad} \end{array}$$

2. For $f(x) = x^2 - 10x + 24$ A = B = C = AC =

$$\begin{array}{r} \underline{\quad\quad} + \underline{\quad\quad} = B \underline{\quad\quad} \\ \underline{\quad\quad} * \underline{\quad\quad} = AC \underline{\quad\quad} \end{array}$$

3. For $f(x) = 8x^2 + 18x + 9$ A = B = C = AC =

$$\begin{array}{r} \underline{\quad\quad} + \underline{\quad\quad} = B \underline{\quad\quad} \\ \underline{\quad\quad} * \underline{\quad\quad} = AC \underline{\quad\quad} \end{array}$$

4. For $f(x) = 3x^2 - 16x - 12$ A = B = C = AC =

$$\begin{array}{r} \underline{\quad\quad} + \underline{\quad\quad} = B \underline{\quad\quad} \\ \underline{\quad\quad} * \underline{\quad\quad} = AC \underline{\quad\quad} \end{array}$$

5. For $f(x) = 4x^2 + 9x + 5$ A = B = C = AC =

$$\begin{array}{r} \underline{\quad\quad} + \underline{\quad\quad} = B \underline{\quad\quad} \\ \underline{\quad\quad} * \underline{\quad\quad} = AC \underline{\quad\quad} \end{array}$$

A-SSE.3/F-IF.8a(18 Released #15 GR DOK 1 and #25 DOK 2 Skill/Concept) (Algebra) and (Functions)

Day 10- Optional (you have no option,) test points daily HW problems.

We will soon be studying factoring and need to recognize what is called a GCF. (Greatest common Factor.) For the set of words, I want you to recognize which letters ALL of the words in the set have in common.

Example 1: Words: "Took", "Broke", and "Make" ALL only have the letter "K" in common

Example 2: Words: "Schoolwork," "Technology," and "Philosophy" ALL have the letters "o, o, and l" in common. NOTE THAT I WROTE THE LETTER "o" TWICE because each word has the letter o written at least twice. Even though "Schoolwork" has the letter o 3 times the other two words only have the letter o twice, therefore I can only write the COMMON letter o TWICE.

For the table below Identify the common letters that ALL words in the set have.

YOUR PROBLEMS (VIEW AND FOLLOW EXAMPLES 1 and "2")

Word Set	Common Letters
Dictionary Philosophy Integrity	
Involve Revolution Civil	
Geometry Enhancement Empower	

Motivation Contribution Relevant Quadratic	
Reciprocal Derivative Integration Linear	

YOU MAKE! Create a set of 5 words then list the common letters for the set.

Day 11

When we compare 2 lines, we can determine if those two lines are the same line (infinite solutions,) parallel lines (no solutions,) intersecting lines (one distinct solution,) or perpendicular lines (1 distinct solution,) Basically we can say the lines cross, don't cross, or are the exact same line. If two lines do cross then the point at which they cross are solutions on BOTH lines. We will determine if the two lines are parallel, perpendicular, or the same line.

Examples: Are the sets of lines parallel, perpendicular, or the same line?

Ex: 1

Line 1: $y = 2x + 3$

Line 2: $y = \frac{-1}{2}x - 5$

By looking at the slopes we have line 1 with a slope of $m = 2$, and Line 2 with a slope of $m = \frac{-1}{2}$ Since these two lines have slopes that are OPPOSITE RECIPROCAL (flip fraction and change sign,) then they are PERPENDICULAR.

Ex: 2

Line 1: $2x + 3y = 6$

Line 2

$4x + 6y = 24$

Line 1 has a slope of $m = \frac{-2}{3}$ and line 2 has a slope of $m = \frac{-4}{6} = \frac{-2}{3}$ Since these two lines have the same slope it is possible that they are parallel. We must check to see that they are not the exact same line so we must find the y-intercept. (PLUG IN 0 for X and SOLVE FOR Y.) Line 1 has a y intercept of (0, 2), and Line 2 has a y-intercept of (0, 4) These two lines are NOT the same so they must be PARALLEL

DON'T FORGET HOW TO USE $m = \frac{\textit{opposite A}}{B}$ for linear equations in $Ax + By = C$ (standard form)

Your Problems- Complete the table for the two lines. Find the slope and y intercept and place a check in the boxes for Parallel/Perpendicular/or Same Line.

1.)

Lines	Slope	Y-Intercept point	Parallel Slope	Perpendicular	Same Line
$Y = 2x + 5$	$m =$	$(0, \underline{\quad})$			
$Y = -2x - 8$	$m =$	$(0, \underline{\quad})$			

2.)

Lines	Slope	Y-Intercept point	Parallel Slope	Perpendicular	Same Line
$3x - y = 4$	$m =$	$(0, \underline{\quad})$			
$3x - y = 2$	$m =$	$(0, \underline{\quad})$			

3.)

Lines	Slope	Y-Intercept point	Parallel Slope	Perpendicular	Same Line
$-3x + 2y = 12$	$m =$	$(0, \underline{\quad})$			
$3x - 2y = -12$	$m =$	$(0, \underline{\quad})$			

4.)

Lines	Slope	Y-Intercept point	Parallel Slope	Perpendicular	Same Line
$Y = 4$	$m =$	$(0, \underline{\quad})$			
$Y = -2$	$m =$	$(0, \underline{\quad})$			

WRITING: Describe why Perpendicular lines must have slopes that are different signs.

M1.F-LE.3 (18 Released MC #23 DOK 3 Strategic Thinking) (Functions 32-36% - 17)

Day 12- Optional (you have no option,) test points daily HW problems.

In some problems, we are given 2 scenarios that can be modeled by linear and exponential functions. We often have to recognize when one situation passes or is the same as the other. In these instances, it may be sometimes easier to create a table of values instead of creating an equation.

Examples 1: The population in city A is 3000 in the year 2010 and it doubles every 10 years. The population in city B is 7000 and it increases by 1000 every year. What is the first 10 year cycle will the population of city A be greater than city B?

Year	City A Population	City B Population
2010	3000	7000
2020	6000	8000
2030	12000	9000

By creating a table we can see that the 10 year cycle of 2030 produces the population in city A higher than population of city B.

Example 2: The amount of medicine A, in mg, decreases by $\frac{1}{2}$ every hour. The amount of medicine B, in mg decreases by 2 mg each hour. If Rob took 80 mg of medicine A and Lenise took 25 mg of medicine B, after how many hours will Rob and Lenise have the same amount of medicine, in mg, in their body?

Time passed (in hours)	MG of Medicine A	MG of Medicine B
0	80	25
1	40	20
2	20	15
3	10	10

So we see after 3 hours both people will have 10.MG of medicine in their body.

(YOUR PROBLEMS) Complete a table for the following scenario until you have found the correct answer.

1. City A has 10,000 people in the year 2000, and increases by 2000 every year. City B has 3000 people and the population doubles every year. When will be population of city B be greater than that of city A? **YOU MUST SHOW A 3 COLUMN TABLE FOR CREDIT**

YEAR	CITY A	CITY B
2000	10,000	3,000
2001	12,000	6,000
2002	14,000	12,000
2003	16,000	24,000
2004	18,000	48,000
2. City A has 4000 people and the population triples every 5 years. City B has 20,000 people and the population increases by 10,000 every 5 years. At the beginning of which 5- year cycle will city A's population will be greater than city B's population? **YOU MUST SHOW A 3-COLUMN TABLE FOR CREDIT!**
3. Bacteria A decreases by $\frac{1}{3}$ of the initial MG each hour. Bacteria B decreases by 3 MG every hour. If there is 27 MG of bacteria A and 15 MG of bacteria B. Which Bacteria will be completely depleted faster? After how long? **YOU MUST SHOW A 3 COLUMN TABLE FOR CREDIT!**
4. City X has a population in 2004 of 7,000 and double every 4 years. City Y has a population of 13,000 and the population increases by 4000 every 4 years. What will be the first 4-year cycle in which the population of city X is more than that of city Y? **YOU MUST SHOW A 3 COLUMN TABLE FOR CREDIT.**
5. Create your own linear vs exponential situation that can be modeled and answered with a table. Create the table and answer your question.