

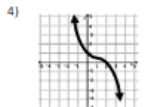
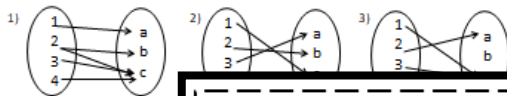
Grade

8

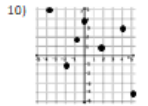
# Functions Worksheets

## Functions - 8.F.1

Determine if the following represent functions:



7)  $\{(8, 2), (-3, 4), (6, -9), (-3, -6)\}$



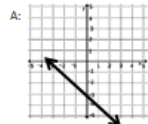
## Functions - 8.F.2

1) Jillian is comparing two different cell phone companies. Both companies are shown. Which company has a lower monthly cost after 2 months?

Company A:  $y = 15x + 20$  Lower Monthly Cost after \_\_\_\_\_

Months	1	2	4
Cost	50	70	110

2) Which function has a greater y-intercept?



3) Order the functions from least to greatest.

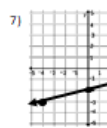
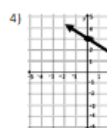
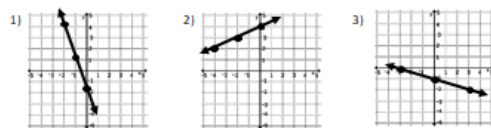
x	-2	0	2	4	6
y	0	4	8	12	16

4) Explain how to determine the rate of change.

Table: \_\_\_\_\_  
Graph: \_\_\_\_\_  
Equation: \_\_\_\_\_

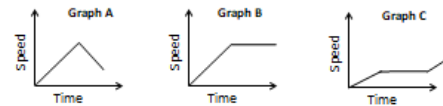
## Functions - 8.F.4

Find the rate of change using rise over run, be sure to show your work on the graph. Also, write the equation for the function.



## Functions - 8.F.5

Match the graphs that go with the following situations:

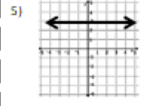
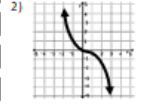


- Malik begins his ride slowly but then stops to talk with some friends on jet skis. After a few minutes, he continues his ride, gradually increasing his speed.
- Sara steadily increases her speed through most of her ride. After about ten minutes she slows down to turn around and returns to the boat dock.
- Mike steadily increases his speed for the first part of his ride. He then keeps a constant speed as he continues his ride.

Graph the following situations

- A car is moving at a constant speed and then gradually stops.
- Jamie turns on her car, backs out of the driveway, stops for a car to go by and then continues driving at a constant rate until she gets to a stop sign. Once it is clear she accelerates to the speed limit.
- Maggie leaves home and goes to the mall. She stays at the mall to do a little Christmas shopping and then leaves to go to dinner with her friends which is even farther away from her house.

Determine if the following



Determine if the following equations are linear or not

- $y = \frac{2}{3}x + 4$
- $y = x^2 + 1$
- $y = |x|$
- $y = 4x^3 - 5$



By: Math in the Midwest

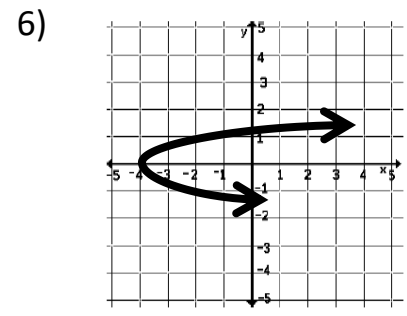
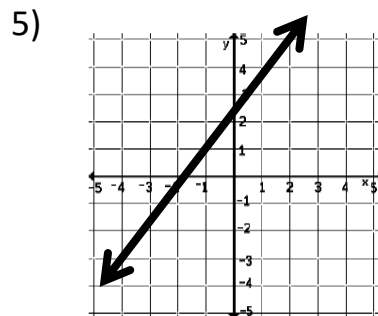
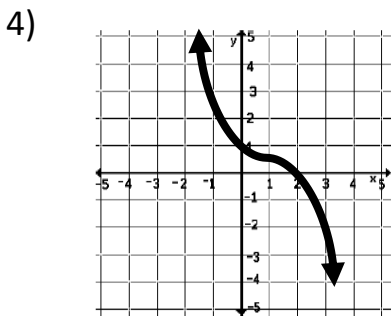
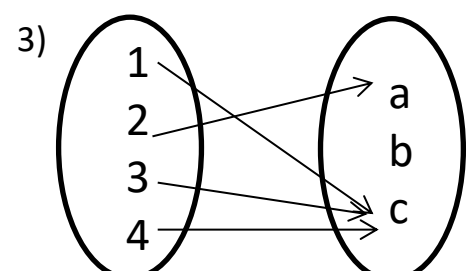
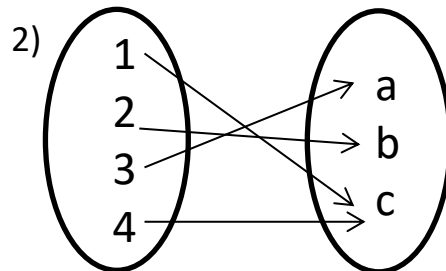
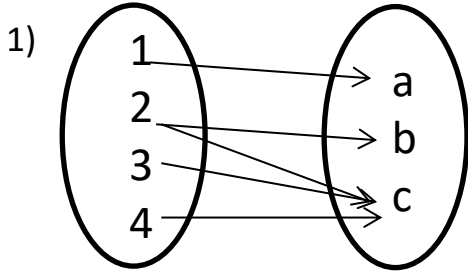
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## Functions – 8.F.1

Determine if the following represent functions:



7)  $\{(8, 2) (-3, 4) (6, -5) (-3, -6)\}$

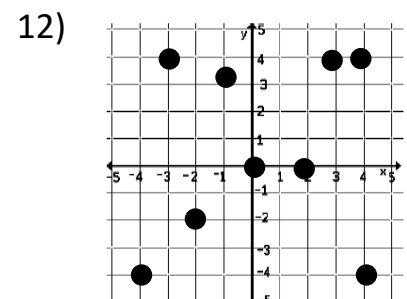
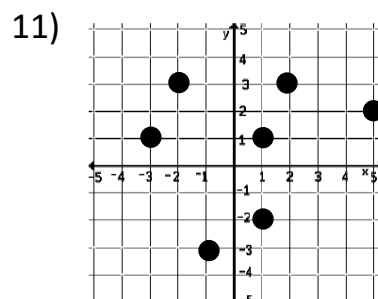
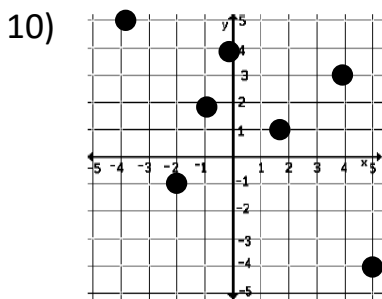
\_\_\_\_\_

8)  $\{(-4, 2) (3, 3) (8, 4) (-4, -6)\}$

\_\_\_\_\_

9)  $\{(-4, 2) (-6, 3) (-8, 4)(12, -6)\}$

\_\_\_\_\_



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Functions – 8.F.1

**Fill in the blanks:**

1) A function is a rule that assigns to each \_\_\_\_\_ exactly one \_\_\_\_\_.

**Determine if the following relationships represent functions:**

2)

x	1	2	3	3	5
y	0	3	-2	5	1

3)

x	-1	2	5	6	9
y	-1	-1	3	0	2

\_\_\_\_\_

\_\_\_\_\_

4) Give two examples of a function and two examples of a non-function in any representation you would like such as mapping, table, sequence, set, graph or a scenario. Do not use the examples above.

Function:

Non-Function:

**Explain whether the following situation fits the definition of a function.**

5) Input: The basketball team has numbered uniforms.

Output: Each player wears a uniform with his assigned number.

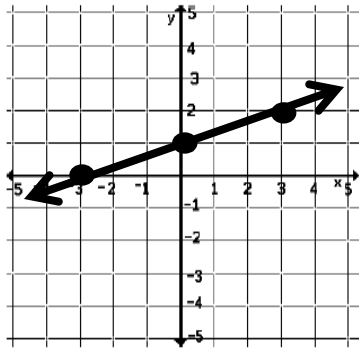
6) Input: The presidential debate is being telecast.

Output: It appears on televisions in millions of homes.

## Functions – 8.F.2

Examine the following sets of functions and determine which one has a greater rate of change.

1) A:



B:  $y = 2x + 3$

Greater Rate of Change: \_\_\_\_\_

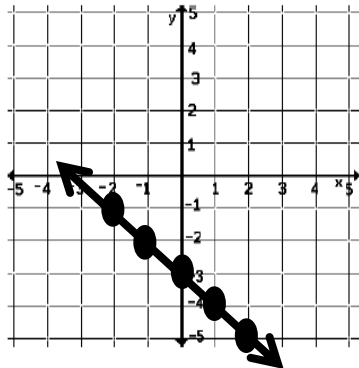
2) A:

x	-1	0	1	2	3
y	0	4	8	12	16

B. A graph is decreasing by a rate of  $\frac{1}{2}$

Greater Rate of Change: \_\_\_\_\_

3) A:



B.

x	3	5	7	9	11
y	0	5	10	15	20

Greater Rate of Change: \_\_\_\_\_

4) A: A graph is increasing by rate of 4

B.  $y = \frac{1}{4}x - 2$

Greater Rate of Change: \_\_\_\_\_

5) A:  $y = -2x + 4$

B.

x	-2	-1	0	1	2
y	1	2	3	4	5

Greater Rate of Change: \_\_\_\_\_

## Functions – 8.F.2

- 1) Jillian is comparing two different cell phone companies Both company's monthly costs are shown. Which company has a lower monthly cost after 2 months?

Company A:  $y = 15x + 20$

Lower Monthly Cost after 2 months:

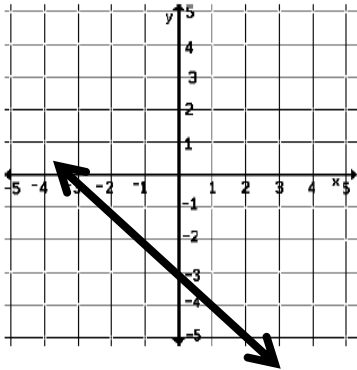
Company B:

Months	1	2	4
Cost	50	70	110

\_\_\_\_\_

- 2) Which function has a greater y – intercept?

A:



B:  $10x + 4y = 20$

Greater y – intercept: \_\_\_\_\_

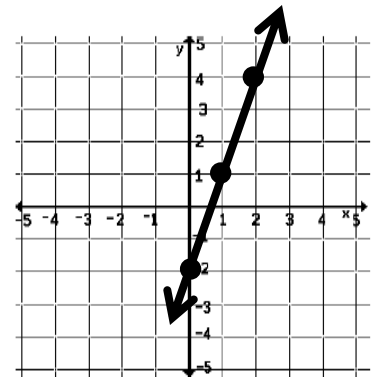
- 3) Order the functions from least to greatest rate of change:

A:

x	-2	0	2	4	6
y	0	4	8	12	16

B:  $y = x - 4$

C:



- 4) Explain how to determine the rate of change from a:

Table: \_\_\_\_\_

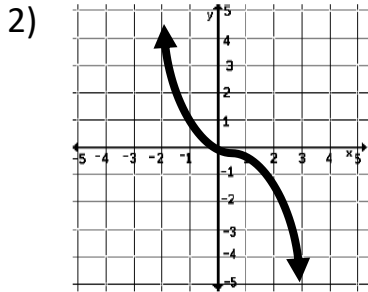
Graph: \_\_\_\_\_

Equation: \_\_\_\_\_

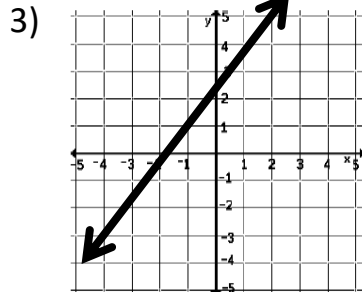
## Functions – 8.F.3

1) Explain in your own words what it means for a function to be linear.

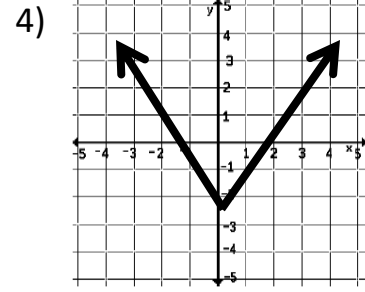
Determine if the following functions are linear or non-linear:



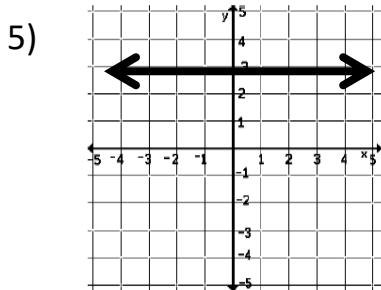
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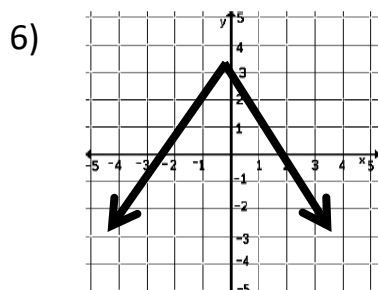
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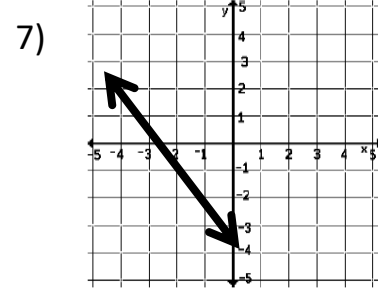
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\_\_\_\_\_



\_\_\_\_\_

Determine if the following equations are linear or non-linear:

8)  $y = \frac{2}{3}x + 4$

\_\_\_\_\_

9)  $y = x^2 + 1$

\_\_\_\_\_

10)  $y = x$

\_\_\_\_\_

11)  $y = |x|$

\_\_\_\_\_

12)  $y = 4x^3 - 5$

\_\_\_\_\_

13)  $y = -2x - 1$

\_\_\_\_\_

Name: \_\_\_\_\_

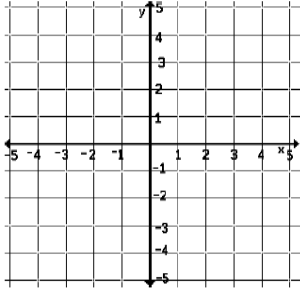
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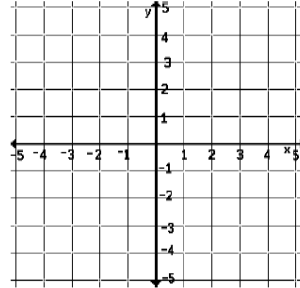
## Functions – 8.F.3

- 1) Give an example of a graph that is linear and an example of a graph that is non-linear:

LINEAR



NON-LINEAR



- 2) Give an example of an equation that is linear and an example of an equation that is non-linear.

LINEAR

NON-LINEAR

- 3) Write the equation of a linear function with slope  $m$ , initial value  $b$ , independent quantity  $x$ , and dependent quantity  $y$ .

**Determine whether the following statements are true or false. If the statement is false correct the sentence to make it true.**

\_\_\_\_\_ 4) A function whose graph is linear is a straight line.

\_\_\_\_\_ 5) Linear functions can be proportional and non-proportional.

\_\_\_\_\_ 6) Every line is a linear function.

\_\_\_\_\_ 7) A function that is linear is increasing or decreasing at a constant rate.

\_\_\_\_\_ 8) A graph that is linear has a curved line.

\_\_\_\_\_ 9) When both values of a function increase together, the function is called a decreasing function.

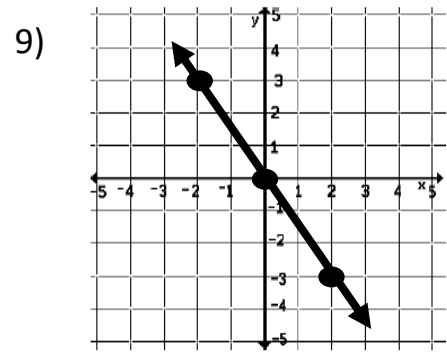
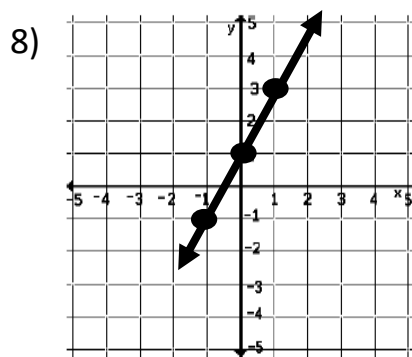
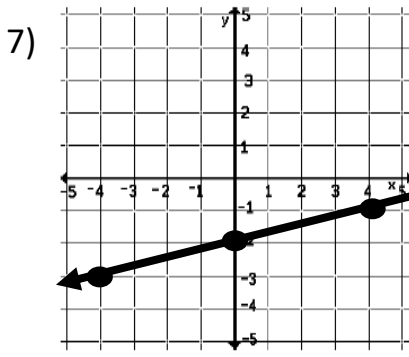
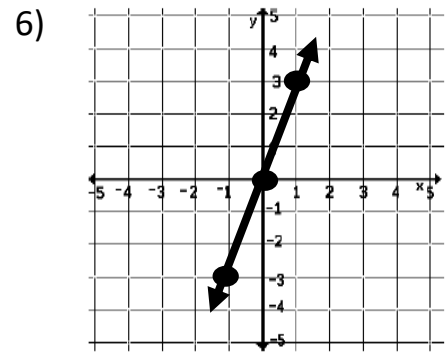
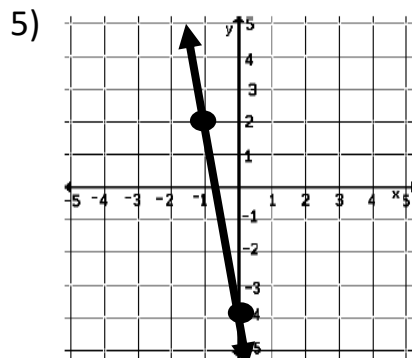
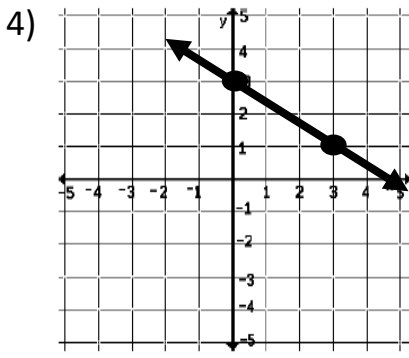
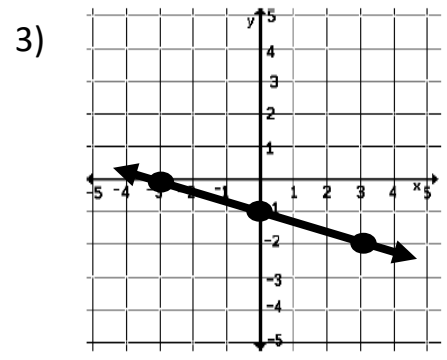
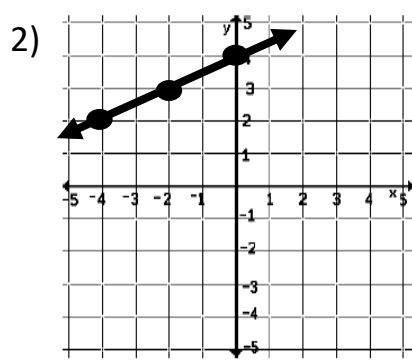
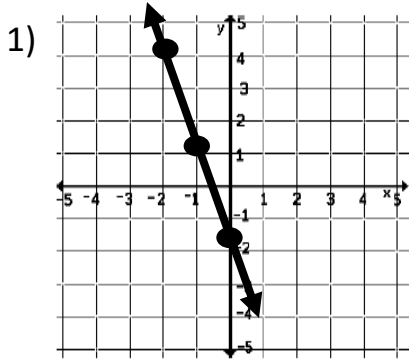
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## Functions – 8.F.4

Find the rate of change using rise over run, be sure to show your work on the graph. Also, write the equation for the function.



\_\_\_\_\_

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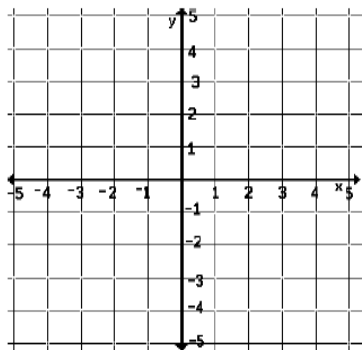
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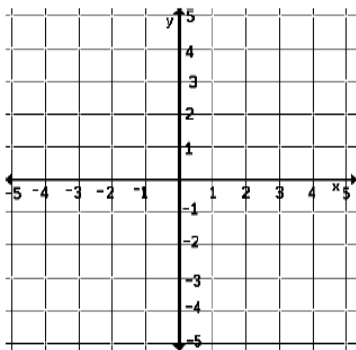
## Functions – 8.F.4

Graph the following functions.

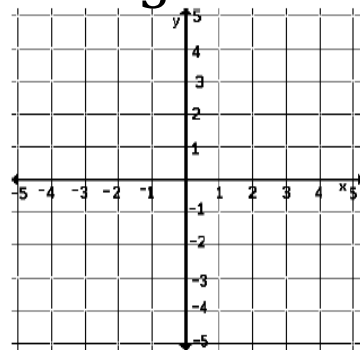
1)  $y = 2x + 4$



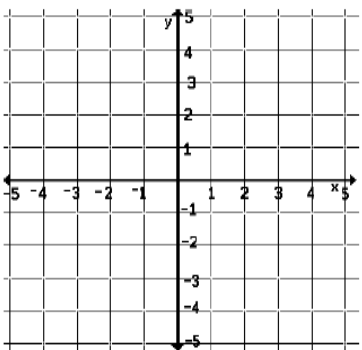
2)  $y = -x - 3$



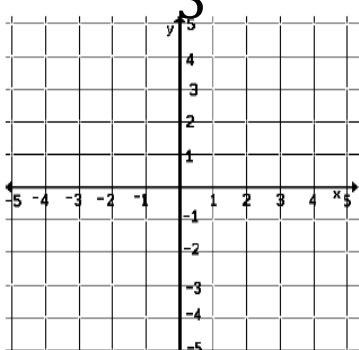
3)  $y = \frac{1}{3}x + 2$



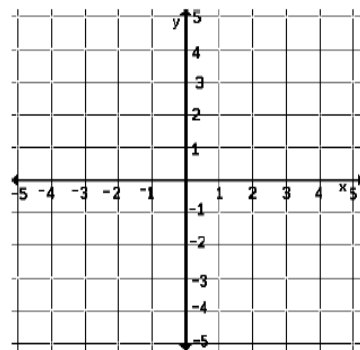
4)  $y = -3x + 1$



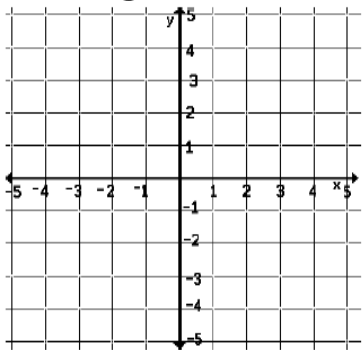
5)  $y = -\frac{2}{3}x + 5$



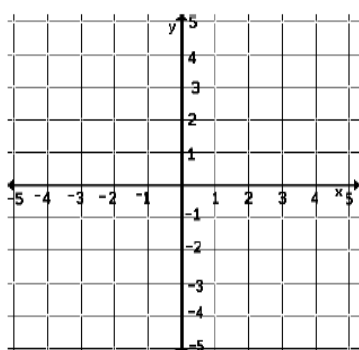
6)  $y = x$



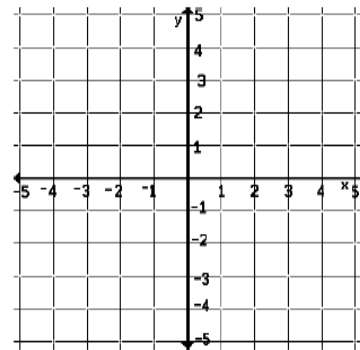
7)  $y = \frac{1}{5}x - 3$



8)  $y = 4x - 1$

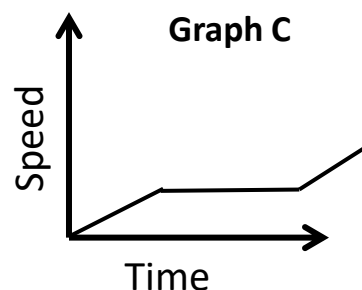
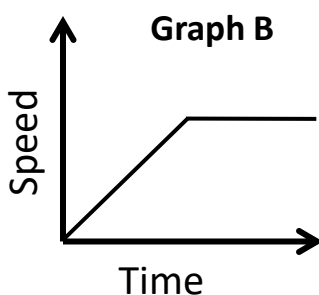
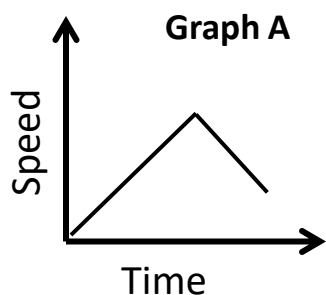


9)  $y = -2x$



## Functions – 8.F.5

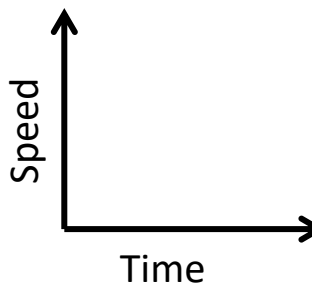
Match the graphs that go with the following situations:



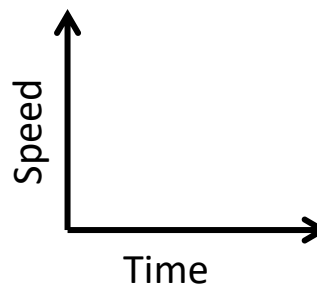
- 1) \_\_\_\_\_ Malik begins his ride slowly but then stops to talk with some friends on jet skis. After a few minutes, he continues his ride, gradually increasing his speed.
- 2) \_\_\_\_\_ Sierra steadily increases her speed through most of her ride. After about ten minutes she slows down to turn around and returns to the boat dock.
- 3) \_\_\_\_\_ Jake steadily increases his speed for the first part of his ride. He then keep a constant speed as he continued his ride.

**Graph the following situations**

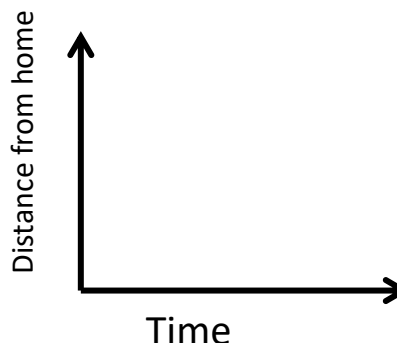
- 4) A car is moving at a constant speed and then gradually stops.



- 5) Jamie turns on her car, backs out of the drive way, stops for a car to go by and then continue driving at a constant rate until she gets to a stop sign. Once it is clear she accelerates to the speed limit.



- 6) Maggie leaves home and goes to the mall. She stays at the mall to do a little Christmas shopping and then leaves to go to dinner with her friends which is even farther away from her house.



Name: \_\_\_\_\_

Date: \_\_\_\_\_

Hour: \_\_\_\_\_

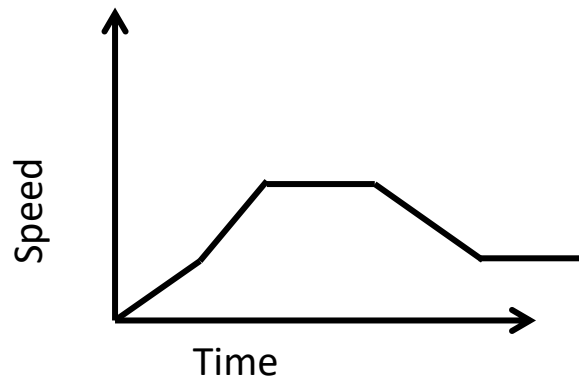
## Functions – 8.F.5

Answer the following questions:

- 1) What does it mean when a graph of speed starts at  $(0, 0)$ ?
- 2) If distance is represent on the  $y$  – axis and time on the  $x$ -axis, what does a line with an upward slope represent?
- 3) If speed is on the  $y$  axis and time on the  $x$ -axis, what does a line with a slope of zero represent?

Write a short story for the following graphs:

4)



5)

