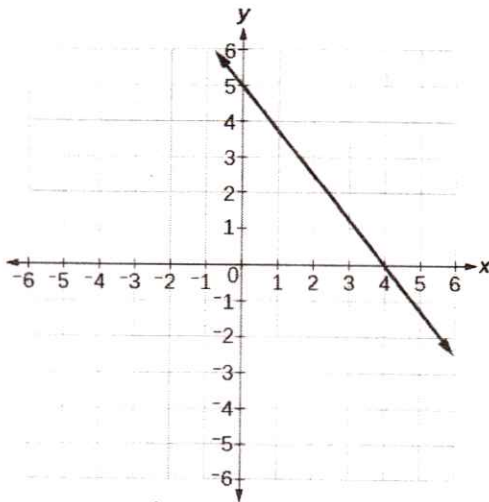


10-24-19 Warm up

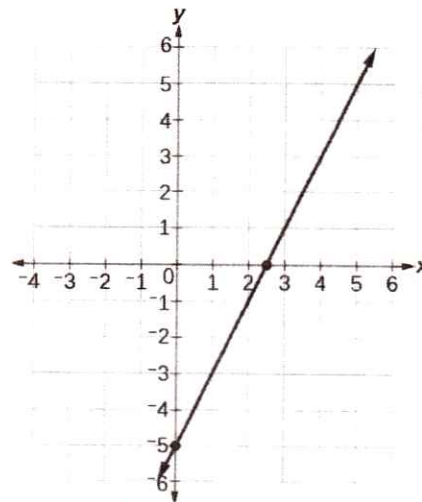
1) For the graphs below, match the characteristics to the correct graph.

You may use an answer more than once

- | | | | | |
|------------------------|--------------------|-------------------|------------------|---------------|
| A) $(-\infty, \infty)$ | B) $(0, -5)$ | C) $(-5, 0)$ | D) $(0, 2.5)$ | E) $(2.5, 0)$ |
| F) $(4, 0)$ | G) $(0, 4)$ | H) $(5, 0)$ | I) $(0, 5)$ | J) $(0, 0)$ |
| K) $(-\infty, 2.5)$ | L) $(2.5, \infty)$ | M) $(-\infty, 4)$ | N) $(4, \infty)$ | O) none |
| P) $-\infty$ | Q) ∞ | | | |



Domain: A
 Constant: O
 Positive: M
 Maximum: O
 Y-Intercept: I
 As $x \rightarrow \infty, f(x) \rightarrow$ P



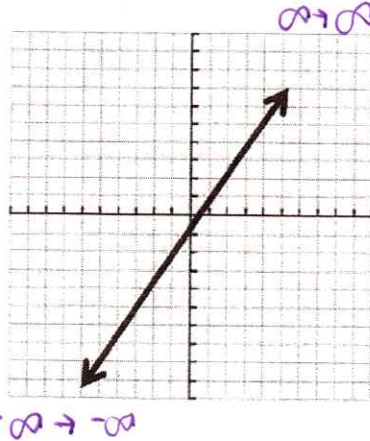
Range: A
 Increasing: A
 Negative: K
 Minimum: O
 X-Intercept: E
 As $x \rightarrow -\infty, f(x) \rightarrow$ P

Unit 5 - Characteristics Quick Check

Name: _____

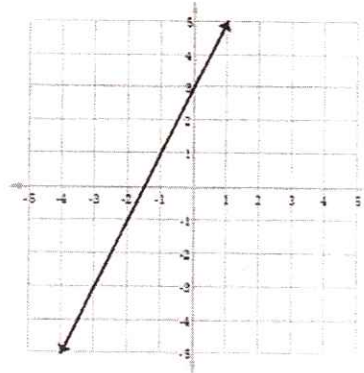
1. Describe the end behavior of the function

- A. As x decreases, $f(x)$ increases
As x increases, $f(x)$ increases
- B.** As x decreases, $f(x)$ decreases
As x increases, $f(x)$ increases
- C. As x decreases, $f(x)$ decreases
As x increases, $f(x)$ decreases
- D. As x decreases, $f(x)$ increases
As x increases, $f(x)$ decreases



2. Which description best describes the following graph?

- T** A. The linear function is increasing.
- F B. The linear function is decreasing.
- F C. The function's slope is -3.
- F D. The function's y-intercept is (0, -1.5).



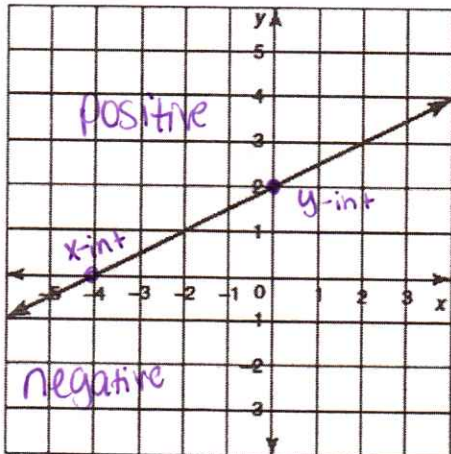
3. Which description best describes the function below?

- F A. The function's slope is -2.
- T** B. The y-intercept of the function is (0, 5).
- F C. The function is increasing.
- F D. The x-intercept of the function is (5, 0).

x	y
-2	11
0	5
1	2
4	-7

$\frac{2-5}{1-0} \rightarrow -3$

4.



Domain: $(-\infty, \infty)$
 X-Intercept: $(-4, 0)$
 Int. of Increase: $(-\infty, \infty)$
 Maximum: none
 Positive: $(-4, \infty)$
 End Behavior: As $x \rightarrow -\infty, f(x) \rightarrow -\infty$

Range: $(-\infty, \infty)$
 Y-Intercept: $(0, 2)$
 Int. of Decrease: none
 Minimum: none
 Negative: $(-\infty, -4)$
 As $x \rightarrow \infty, f(x) \rightarrow \infty$

Zeros: $x = -4$
 Constant: none

$-\infty$ -4 ∞
 n p

Intercepts Practice

Name the x and y-intercepts:

x	0	2	6	8
y	4	3	1	0

x-int
y-int

x	0	1	3	4
y	8	6	2	0

x-int
y-int

x	0	2	4	6
y	9	6	3	0

x-int
y-int

Determine the y-intercept from the given representations:

a.

x	y
6	25
9	34
12	43
15	52

b.

x	y
10	-95
15	-145
20	-195
25	-245

c. $3x + 7y = 63$

$$3x + 7(0) = 63$$

$$3x = 63$$

$$x = 21$$

$$3(0) + 7y = 63$$

$$7y = 63$$

$$y = 9$$

d. $2x - 8y = -48$

$$2x - 8(0) = -48$$

$$2x = -48$$

$$x = -24$$

$$2(0) - 8y = -48$$

$$-8y = -48$$

$$y = 6$$

e. Carmen estimated that she would pay \$19 to park in a downtown parking garage for a 3 hour event. After spending 5 hours downtown, she paid \$25 for parking. What was the initial parking fee (y-intercept)?

f. A photography studio charges \$50 that includes a sitting fee and 6 prints. Luigi increased his order to 11 prints and paid \$65. How much was the sitting fee?

Linear Practice

Find the Slope, y-Intercept, and equation of each:

a.

Number of Balloons	Total Cost of Balloons (in Dollars)
2	6
4	12
6	18
8	24

$\frac{6}{2} \rightarrow 3 = m$
 $b = 0$
 $y = 3x$

b.

Number of Hours	Total Number of Miles Traveled
1	130
5	325
8	520
11	715

$\frac{325 - 130}{5 - 2} \rightarrow \frac{195}{3}$
 $m = 65$
 $b = 0$

$y = 65x$

c.

Number of Photos Printed	Total Cost of Photos (in Dollars)
10	2
20	4
30	6
40	8

$m = \frac{2 - 4}{10 - 20} = \frac{-2}{-10} = \frac{1}{5}$
 $b = 0$

$y = \frac{1}{5}x$

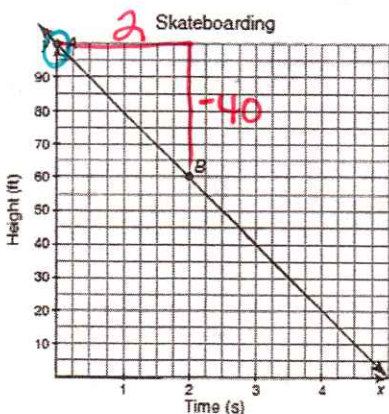
d.

Number of Greeting Cards	Total Cost of Greeting Cards (in Dollars)
1	3.25
2	6.50
3	9.75
6	19.50
8	26.00

$\frac{9.75 - 6.50}{3 - 2} = 3.25$
 $m = 3.25$
 $b = 0$

$y = 3.25x$

e. Dwayne is riding his skateboard down a hill



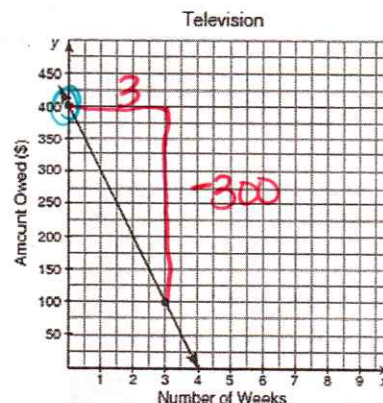
$\frac{-40}{2} \rightarrow -20 = m$
 $b = 100$

$y = -20x + 100$

What does the y intercept mean?

Dwayne's starting height.

f. What Roger owes on his TV



$\frac{-300}{3} \rightarrow -100 = m$
 $b = 400$

$-100 + 400$

What does the y intercept mean?

Starting amount owed on tv

****Put in Slope intercept form and name the Slope and Y-Intercept:**

a. $2x + 3y = 21$

$$\frac{-2x}{3} = \frac{-2x+21}{3}$$

$$y = -\frac{2}{3}x + 7$$

$m = -\frac{2}{3}$ $b = 7$

b. $8y - 2x = 24$

$$\frac{+2x + 24}{8} = \frac{+2x + 24}{8}$$

$$y = \frac{1}{4}x + 3$$

$m = \frac{1}{4}$ $b = 3$

c. $y = 8$

$m = \emptyset$
 $b = 8$



d. $x = 2$

$m = \text{undefined}$
 $b = \text{none}$



Find the Slope and Y intercept of the following:

e. $(7, 1)$ and $(21, 11)$

$$\frac{11-1}{21-7} = \frac{10}{14} \rightarrow \frac{5}{7}$$

Every 7 x's,
y changes by 5

x	0	7	14	21
y	-4	1	6	11

$b = -4$

f. $(2, -7)$ and $(4, -10)$

$$\frac{-10 - (-7)}{4 - 2} = \frac{-3}{2}$$

x	y
0	-4
2	-7
4	-10

g. Jamal is shopping with a gift card he received for his birthday. After he purchases two T-shirts, the gift card balanced dropped from \$50 to 20.02. What is the cost per shirt?

x	y
0	50
2	20.02

$$\frac{20.02 - 50}{2 - 0} = \frac{-29.98}{2} \rightarrow \$14.99 \text{ per shirt}$$

Started w/ \$50
y-int

h. Rachel loves reading and is participating in a read a thon to raise money for a charity. She plans to read 15 books during the 90 day period. During the first 30 days, she reads 7 books. What is the unit rate of the number of days she has to read each book to reach her goal?

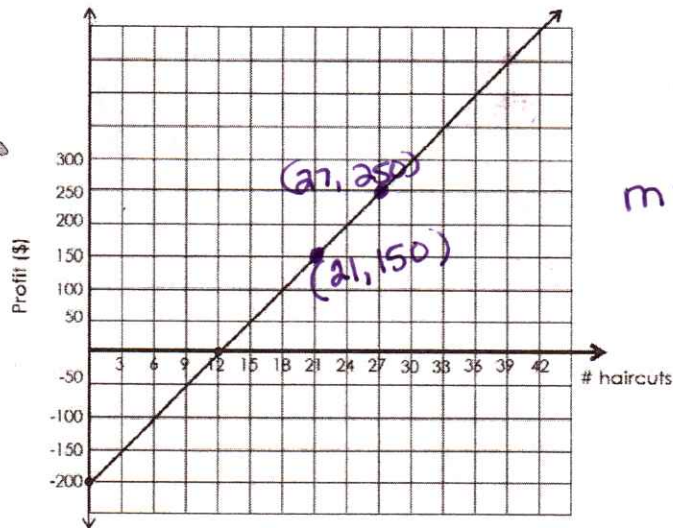
days	books
90	15
30	7

$$\frac{7-15}{30-90} = \frac{-8}{-60} \rightarrow .13 \text{ books per day}$$

Interpreting Slope and Intercepts

The Hair Stylist

Adrienne is a hairstylist at a new age salon. She pays a monthly fee to rent a station at the salon. The graph below represents the profit she makes each month based on the number of haircuts she performs.



$$m = \frac{250 - 150}{27 - 21} \rightarrow \frac{50}{3}$$

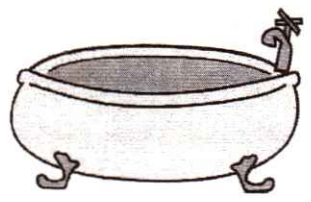
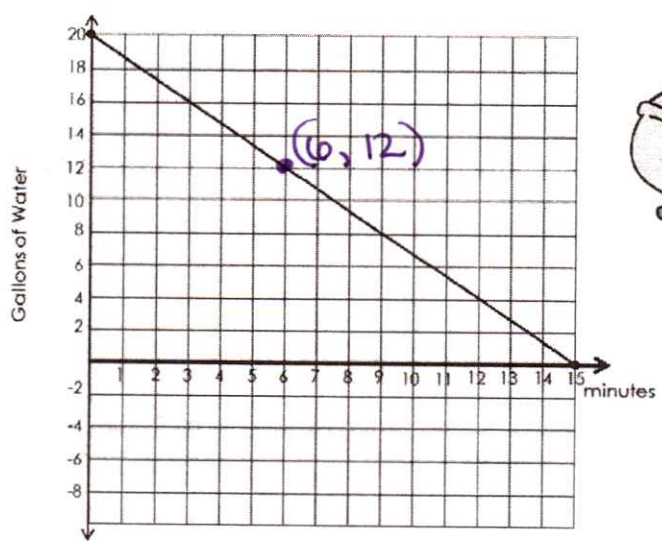
Use the graph to answer the questions below.

- 1) If Adrienne does 21 hair cuts, what is her profit? \$150
- 2) What is the slope of the line? 50/3
- 3) What do the numbers in the slope represent in the context of the problem?
for every 3 cuts, Adrienne makes \$50.
- 4) What is the x-intercept? (12, 0)
- 5) What do the values (x, y) of the x-intercept mean in the context of the problem?
she must do 12 haircuts to break even
- 6) What is the y-intercept? (0, -200)
- 7) What do the values (x, y) of the y-intercept mean in the context of the problem?
she is \$200 in the hole before she starts cutting hair.

Interpreting Slope and Intercepts

The Bath Tub

Billy Bob has an ancient bathtub that drains slower than the dickens. He filled up his tub and then let the water drain out to see how long it would take to drain. The graph below represents the number of gallons of water remaining in the tub and the time in minutes.



$$\frac{15-4}{0-12} \rightarrow \frac{9}{-12} \rightarrow -\frac{3}{4}$$

Use the graph to answer the questions below.

- 1) How many gallons of water are in Billy Bob's tub after 6 minutes? 12 gal
- 2) What is the slope of the line? $-\frac{3}{4}$
- 3) What do the numbers in the slope represent in the context of the problem?
every 4 mins, 3 gallons of water has drained from the tub
- 4) What is the x-intercept? (15, 0)
- 5) What do the values (x, y) of the x-intercept mean in the context of the problem?
it takes 15 minutes to drain all the water
- 6) What is the y-intercept? (0, 20)
- 7) What do the values (x, y) of the y-intercept mean in the context of the problem?
the tub started w/ 20 gallons of water

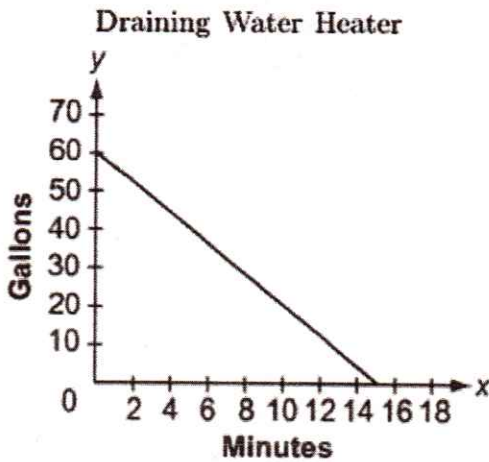
Extra Practice Assignment

Name: _____

Date: _____ Block: _____

Directions: For each of the following graphs, answer the following questions:

1. Water is draining from a hot water heater:



a. What is the domain?

$$[0, 15]$$

b. What is the range?

$$[0, 60]$$

c. What is the slope (simplified and labeled)?

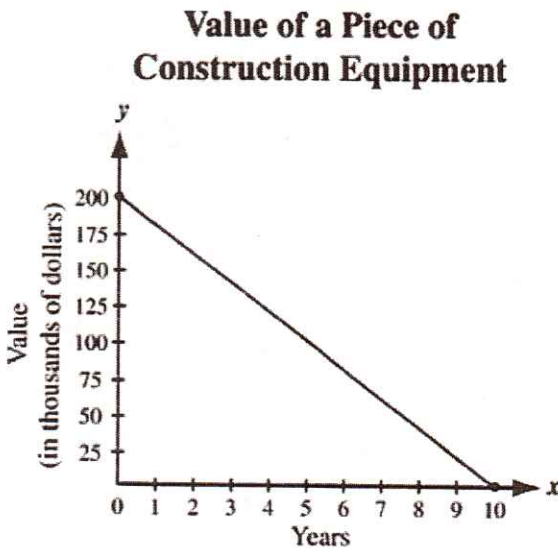
$$\frac{\Delta y}{\Delta x} \rightarrow \frac{60}{15} \rightarrow 4 \text{ gallons per min}$$

d. What are the x and y intercepts? Interpret this in terms of the problem scenario.

x: (15, 0) takes 15 mins to drain

y: (0, 60) started w/ 60 gallons of water

2. The value of a piece of construction equipment as it depreciates:



a. What is the domain?

$$0 \leq x \leq 10$$

b. What is the range?

$$0 \leq y \leq 200$$

c. What is the slope (simplified and labeled)?

$$\frac{\Delta y}{\Delta x} \rightarrow \frac{200}{10} \rightarrow \$20 \text{ per year}$$

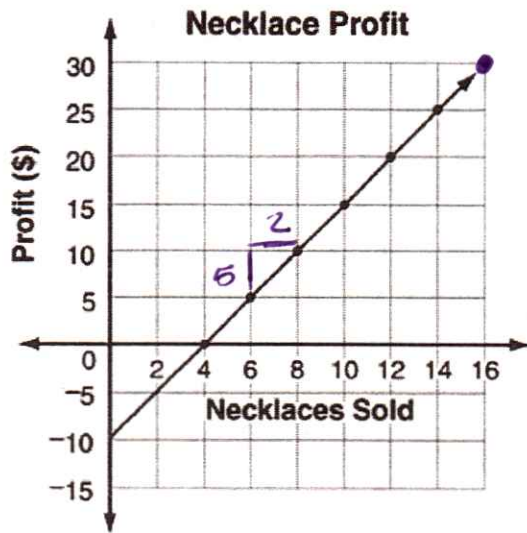
d. What are the x and y intercepts? Interpret this in terms of the problem scenario.

x: (10, 0) it takes 10 years to reach maximum depreciation value.

y: (0, 200) Cost of equipment

3. Amount of profit Julia makes from selling necklaces (assume Julie has no more than 16 necklaces to sell):

Stop at 16



a. What is the domain?

$[0, 16)$

b. What is the range?

$[-10, 30)$

c. What is the slope (simplified and labeled)?

$\frac{5}{2}$ - Julia makes \$5 for every 2 necklaces sold.

d. What are the x and y intercepts? Interpret this in terms of the problem scenario.

x: (4, 0) She must sell 4 necklaces to break even.

y: (0, -10) When she has sold 0 necklaces, she is \$10 in debt.

4. Time spent mowing and the amount of gas remaining in the lawn mower:

Time Spent Mowing (hours)	Gas in Lawn Mowers (gallons)
0	110
24	80
48	50
72	20
88	0

a. What is the domain?

$(0, 88)$

b. What is the range?

$(0, 110)$

c. What is the slope (simplified and labeled)?

$\frac{\Delta y}{\Delta x} \rightarrow \frac{-20}{16} \rightarrow -\frac{5}{4}$ gallons per hour

d. What are the x and y intercepts? Interpret this in terms of the problem scenario.

x: (88, 0) # of hours before the gas runs out.

y: (0, 110) # of gallons when you start