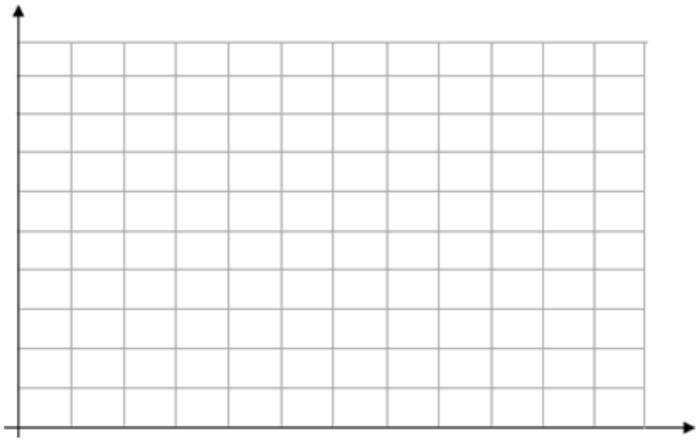
Algebra 1-2: 3.1a Relationships between Numerical Data
Homework (Textbook Section 10.1)

Name: _____Per: _____

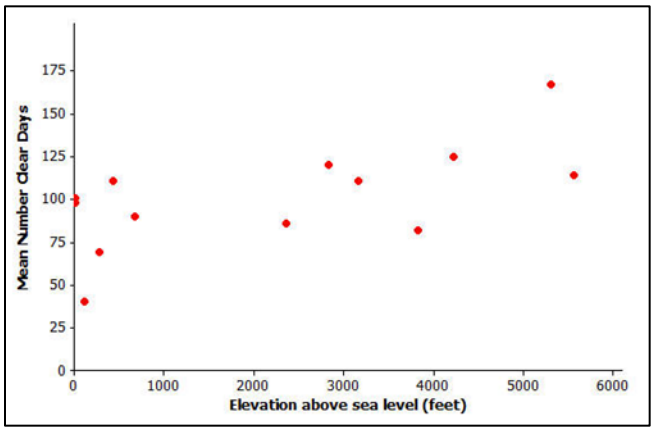
1) Construct a scatter plot that displays the data for x = elevation above sea level (in feet) and w = mean number of *partly cloudy days per year*.



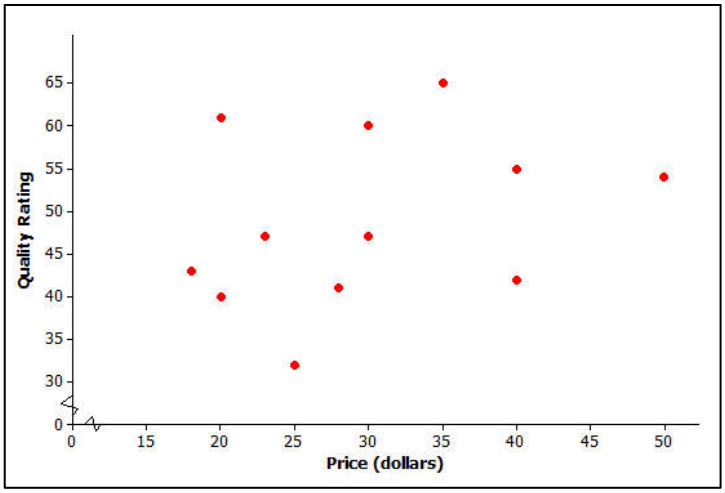
City	x = Elevation Above Sea Level (ft.)	w = Mean Number of Partly Cloudy Days per Year
Albany, NY	275	111
Albuquerque, NM	5,311	111
Anchorage, AK	114	60
Boise, ID	2,838	90
Boston, MA	15	103
Helena, MT	3,828	104
Lander, WY	5,557	122
Milwaukee, WI	672	100
New Orleans, LA	4	118
Raleigh, NC	434	106
Rapid City, SD	3,162	115
Salt Lake City, UT	4,221	101
Spokane, WA	2,356	88
Tampa, FL	19	143

2) Based on the scatter plot, is there a relationship between elevation and the mean number of partly cloudy days per year? If so, how would you describe the relationship? Explain your reasoning.

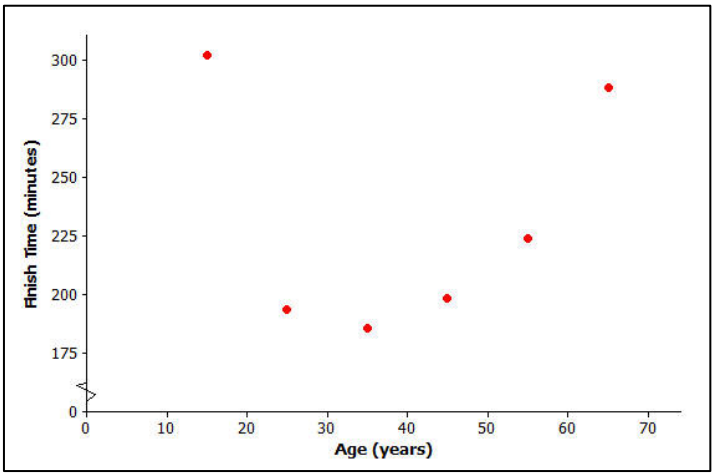
3) You are traveling around the United States with friends. After spending a day in a town that is 2000 feet above sea level, you plan to spend the next several days in a town that is 5000 feet above sea level. Given the scatterplot, is this town likely to have more or fewer clear days per year than the town that is 2000 feet above sea-level? Explain your answer.



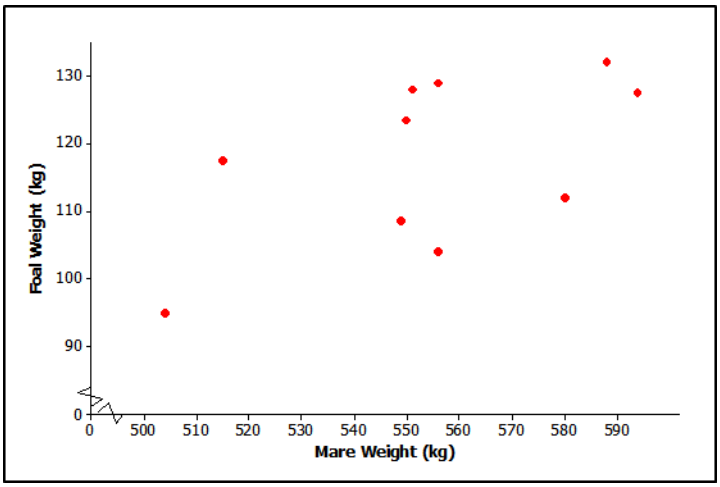
4) You plan to buy a bike helmet. Based on in the scatterplot, will buying the most expensive bike helmet give you a helmet with the highest quality rating? Explain your answer.



5) Based on in the scatterplot, describe the relationship between finish time and age.



6) A mare is a female horse and a foal is a baby horse. Describe the relationship between a foal's birth weight and a mare weight.



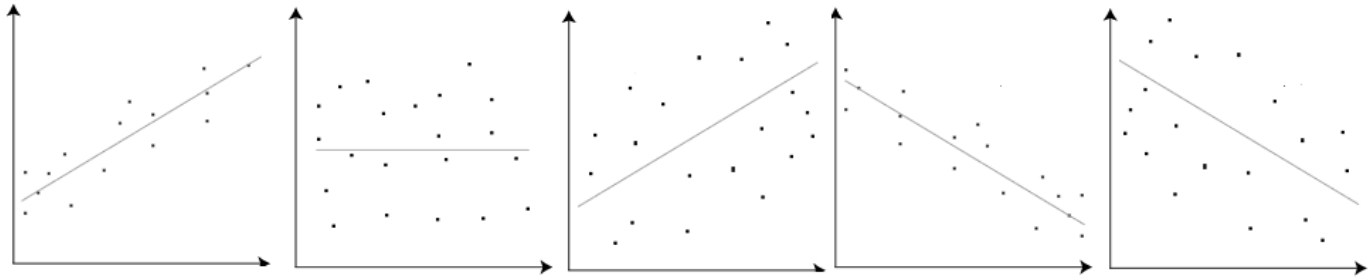
Algebra 1-2: 3.1b Measuring the Strength of Linear Relationships Homework (Textbook Section 10.1)

Name: _____Per: _____

1) Match the correlation coefficients to the appropriate graph:

$r = 0$ $r = .3$ $r = -.3$ $r = .7$ $r = -.7$

a)_____ b) _____ c)_____ d)_____ e)_____

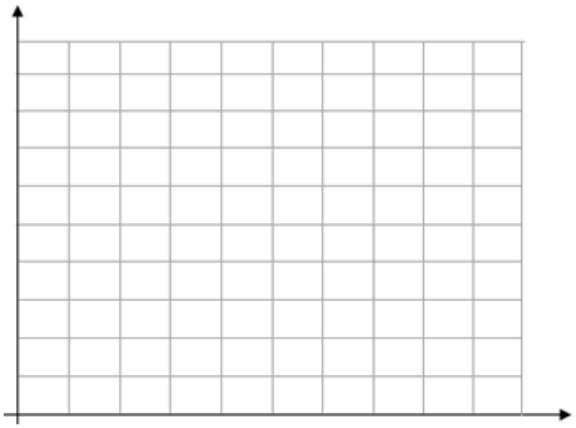


2) The data in the table below shows the speed of winds in some major US cities.

Speed of Winds in Some U.S. Cities

Station	Average Speed (mi/h)	Highest Speed (mi/h)
Atlanta, GA	9.1	60
Casper, WY	12.9	81
Dallas, TX	10.7	73
Mobile, AL	9.0	63
St. Louis, MO	9.7	60

Source: National Climatic Data Center



a. Construct a scatter plot of the data.

b. Draw a line of best fit for the data.

c. Is there a *positive correlation,* a *negative correlation,* or *no correlation* between average wind speed and highest wind speed? _____

d. Describe the relationship between a cities average and highest wind speed.

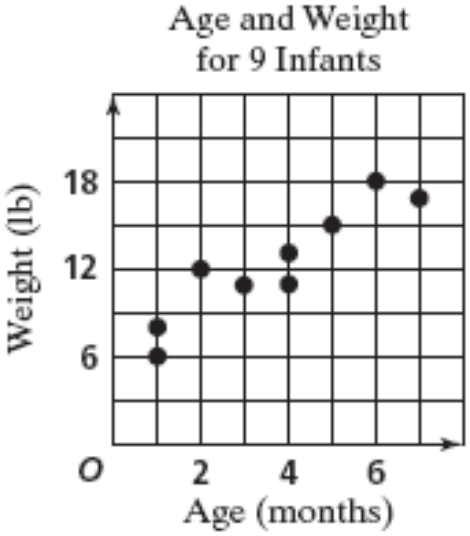
Would you expect a *positive, negative,* or *no correlation* between the two data sets? Explain why.

3) a person's age and the number of pets he or she has

4) the number of times you brush your teeth and the number of cavities you get

5) the number of days it rains per year and the number of umbrellas sold

6) The scatter plots shows the relationship between an infant's age and weight.



a. What does a point represent?

(_____, _____)

b. How can you tell if some infants weighed the same?

c. How can you tell which infants were weighed at the same age?

d. Give an estimate for the correlation coefficient of the graph. _____

7) Olivia notices that if she picks a very large scale for her y-axis, her data appear to lie more along a straight line than if she zooms the scale all the way in. She concludes that she can use this to increase her correlation coefficient and make a more convincing case that there is a correlation between the variables she is studying. Is she correct?

Algebra 1-2: 3.2a Introduction to Rate of Change

Name: _____Per: _____

Homework (Textbook Section 5.3)

1) Look for a pattern in each data set. Which ones would be best modeled by a linear function? Why?

a.

Population Growth of Bacteria	
Time (hours)	**Number of Bacteria**
0	2,000
1	5,000
2	12,500
3	31,250
4	78,125

b.

Time (days)	3	4	5	6	7	8	9
Height (mm)	1	4	7	10	13	16	19

c.

Time in Hours Since Tracking Started (t)	0	1	2	3	4
Distance from Island in Miles ($f(t)$)	325	310	295	280	265

For questions 2-5, find the average rate of change. Express it as a unit rate: "something per ONE something."

2) At 7pm the temperature is 63°F. At 10pm it is 45°F

3) At 3pm a car leaves Phoenix. By 5pm it has traveled 120 miles.

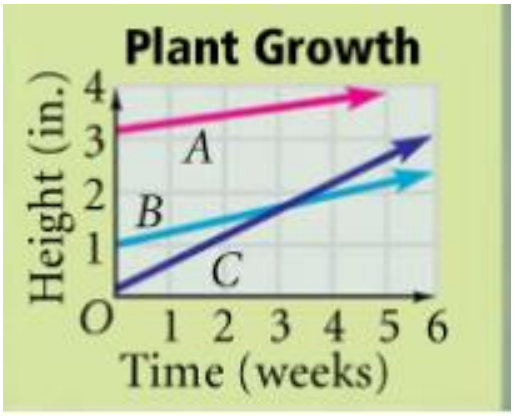
4) A baby is 18" long at birth, and 27" long at ten months.

5) A parachutist is 8000 ft above the ground at 12:05. At 12:09 he is 5400 ft above the ground.

6) This table shows the U.S. federal minimum hourly wage in different years. Find the rate of change for each time period and then identify which time interval had the greatest rate of change.

Year	1981	1991	1997	2009	2015
Wage	3.35	4.25	5.15	7.25	7.25

7) Calculate the rate of change for each plant in the graph at left.



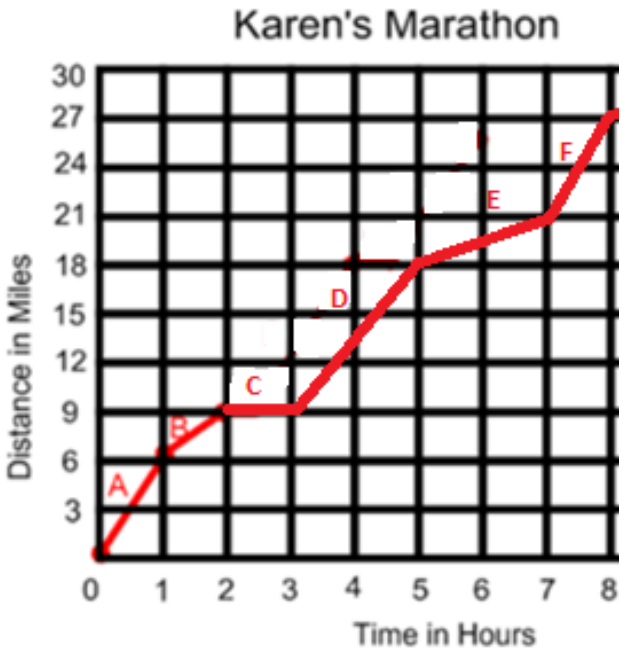
A:

B:

C:

8) What conclusions can you make based on the data from question 7?

Use the graph to answer the questions 9-12.



9) Find the rate of change for each interval of the race

A:

B:

C:

D:

E:

F:

10) Find an average rate of change for the entire race.

11) Explain what you think may have happened in interval C?

12) If the rate of change for interval A had remained constant throughout the race, how long would it have taken Karen to finish the marathon? (A marathon is 26 miles.)

Algebra 1-2: 3.2b Linear Functions and Slope Homework Name: _____Per: _____

(Textbook Section 5.3)

Find the slope of the line that passes through each pair of points.

1. (–2, 5), (3, –4)

2. (2, 4), (6, 7)

3. (–2, –5), (4, 5)

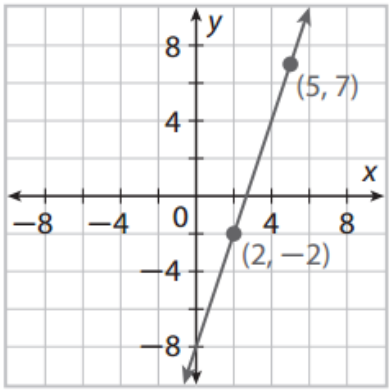
4. (–3, –2), (4, –2)

5. (4, –2), (4, 9)

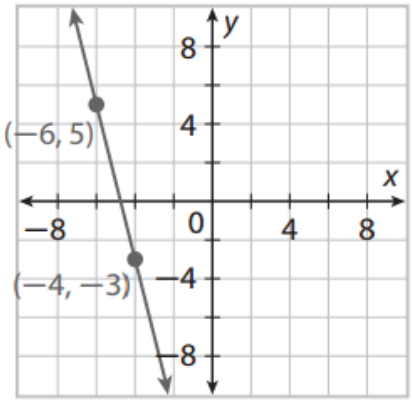
6. (5, 2), (8, –4)

Find the slope of each line

7.

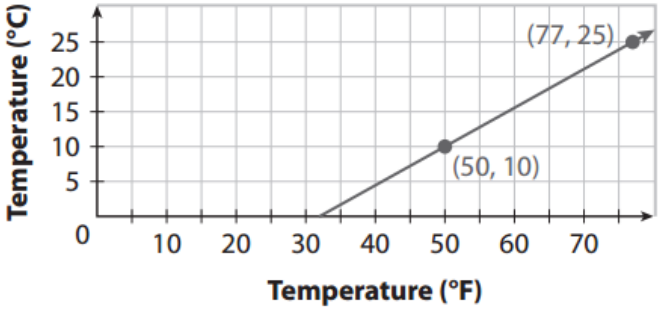


8.



Find and interpret the slope.

9)



10) The number of cubic feet of water y in a reservoir x hours after the water starts flowing into the reservoir is a linear function. The points (40, 3000) and (60, 4000) are on the line of the function.

Find and interpret the slope.

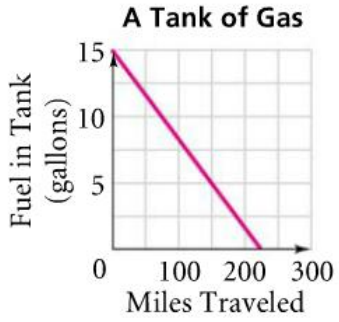
11)

Time (hours)	Temperature (°F)
1	−2
4	7
7	16
10	25
13	34

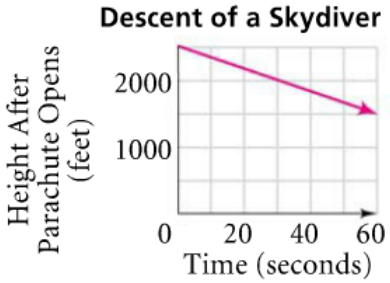
12)

People	Cost (dollars)
2	7.90
3	11.85
4	15.80
5	19.75
6	23.70

13) a.



b.



14) **Explain the Error** A student is asked to find the slope of a line containing the points (4, 3) and (-2, 15) and finds the slope as shown. Explain the error.

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{4-(-2)}{3-15} = \frac{6}{-12} = -\frac{1}{2}$$

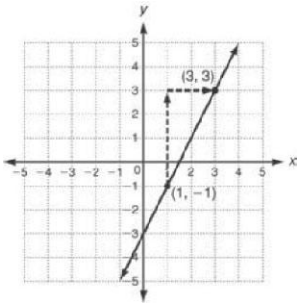
Name: _____Per: _____

Algebra 1-2: 3.1 to 3.3 Review

1) Match the correlation coefficients to the graph: $r = 0$ $r = .65$ $r = -.65$ $r = .9$ $r = -.9$

_____ _____ _____ _____ _____

2) **Find the slope of each line.**



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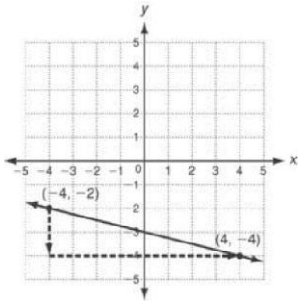

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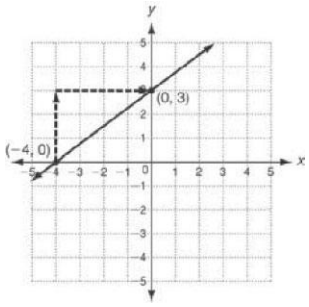

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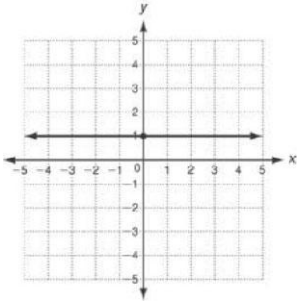

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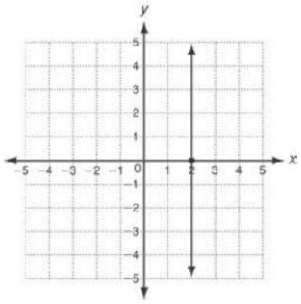

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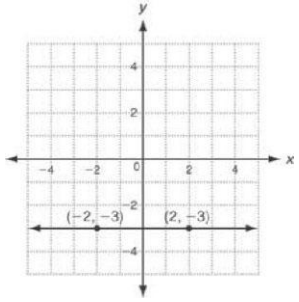


_____

3) **Find the rate of change or slope of the line containing each pair of points.**

(4, 5) and (11, 33)

_____

(–4, 8) and (3, –9)

_____

(0, –8) and (3, 3)

_____

$\left(\frac{1}{4}, \frac{1}{2}\right)$ and $\left(\frac{1}{6}, \frac{1}{3}\right)$

_____

4) The table shows a truck driver's distance from home during one day'deliveries. Find the rate of change for each time interval.

Times (h)	0	1	4	5	8	10
Distance (mi)	0	35	71	82	199	200

Hour 0 to Hour 1: _____ Hour 1 to Hour 4: _____ Hour 4 to Hour 5: _____

Hour 5 to Hour 8: _____ Hour 8 to Hour 10: _____

5) The table shows the year and the cost of sending 1-ounce letter in cents. In which interval did the cost increase at the greatest rate?

Year	2003	2004	2006	2008	2013	2014
Cost (cents)	37	37	39	42	46	49

6) Use rates of change to determine if the functions are linear. Justify your answers.

a.

x	*y*
4	-64
5	-100
6	-144
7	-196
8	-256

b.

x	*y*
-5	-44
-4	-35
-3	-26
-2	-17
-1	-8

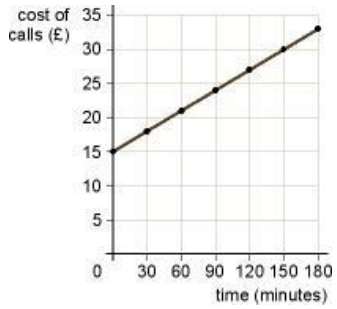
7) A line has a slope of $-\frac{3}{2}$. Which of the following sets of points could be on the line?

a. $(-2,2)$ and $(4,11)$ b. $(-6,14)$ and $(-2,8)$ c. $(-3,3)$ and $(3,7)$

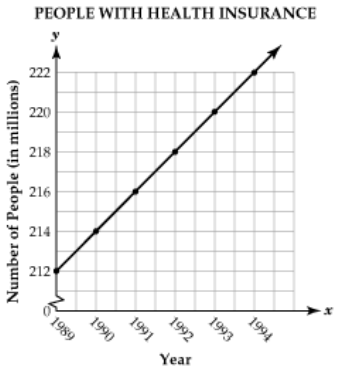
8) The cost, in dollars, charged by an electric company for energy depends upon the number of kilowatt-hours used. Using the points (600, 60) and (1000, 112), find the average rate of change in the cost of electricity.

9) Find the rate of change for the following linear functions and explain what it means for each situation.

a)

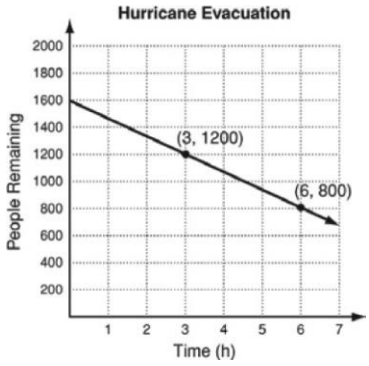


b)



c)

d)



Algebra 1-2: 3.3a Graphs of Linear Functions Homework Name: _____Per: _____

(Textbook Section 6.1)

Find the slope and y-intercept of each equation.

1. $y = x + 2$ **2.** $y = \frac{1}{2}x - 4$ **3.** $y = 2x - 1$ **4.** $y = \frac{2}{5}x + 3$

Write an equation of a line in slope-intercept form with the given slope and *y*-intercept.

5. *slope* $= 4$, *y-intercept* $= 8$ **6.** *slope* $= -2$, *y-intercept* $= -6$ **7.** *slope* $= -\frac{9}{5}$, *y-intercept* $= -7$

8. Given the pair of linear equations, describe how the second graph would differ from the first:

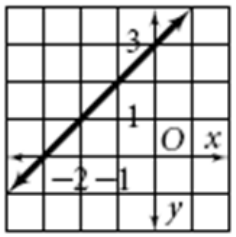
A. $y = 3x + 6$, $y = 3x - 2$

B. $y = 4x + 1$, $y = -4x + 1$

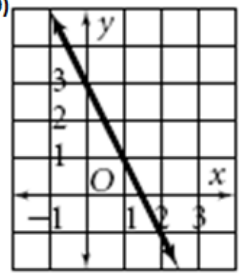
C. $y = 3x + 5$, $y = \frac{1}{2}x + 5$

Write the slope-intercept form of the equation of each line: (look carefully for the x and y axis)

9)



10)



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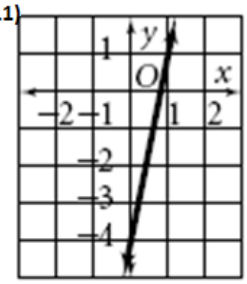

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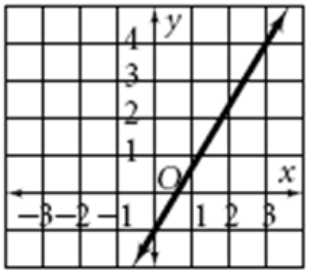

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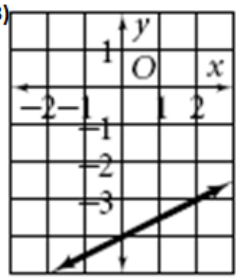
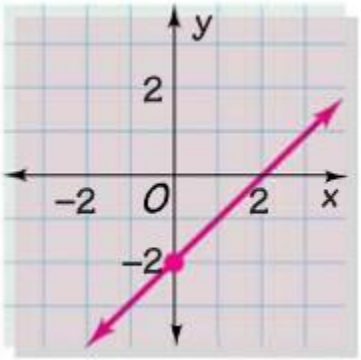


14) Perry drew the graph at right for the equation $y = -2x + 1$

Explain the error she made and then correctly graph the equation.

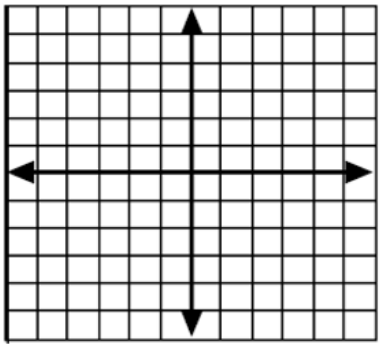


Algebra 1-2: 3.3b Graphing Linear Functions Homework Name: _____Per: _____

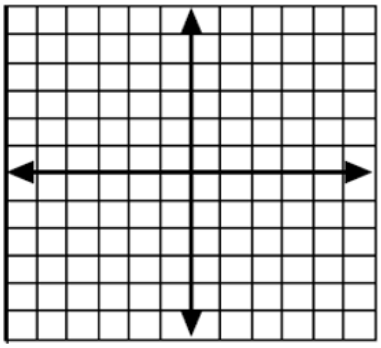
(Textbook Section 6.1)

Graph each equation.

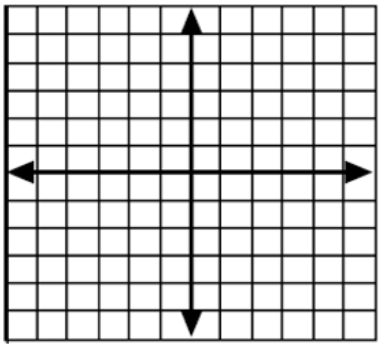
1) $y = \frac{1}{2}x + 4$



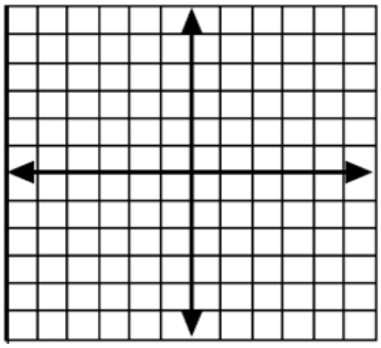
2) $y = \frac{2}{3}x - 1$



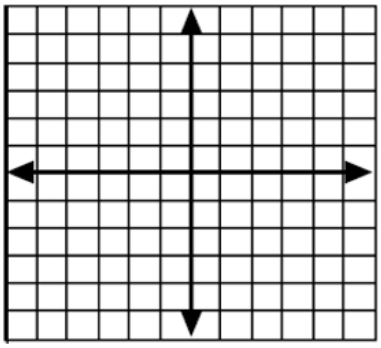
3) $y = -5x + 2$



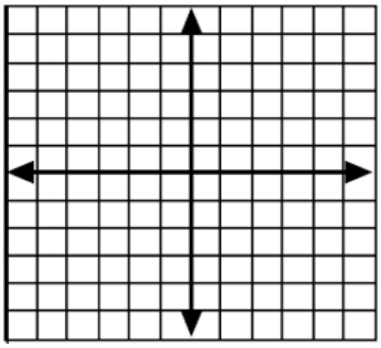
4) $y = x + 4$



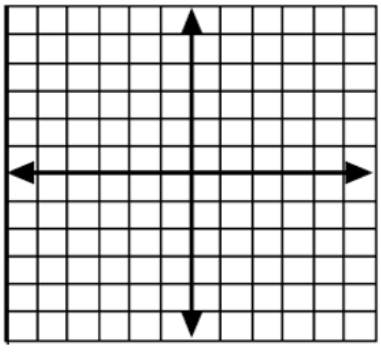
5) $y = -x + 2$



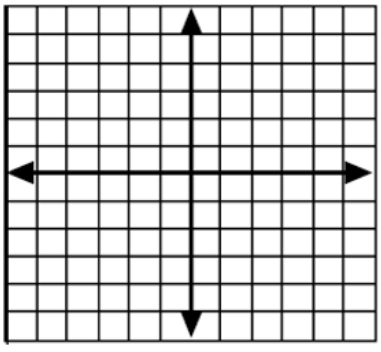
6) $y = 7 - 3x$



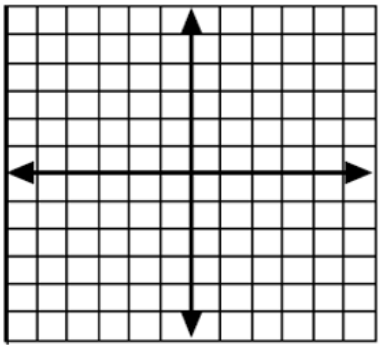
7) $y = -\frac{3}{2}x$



8) $2y + 4x = 4$



9) $3y + 6 = -2x$



Algebra 1-2: 3.3c Modeling Linear Relationships Homework Name: _____Per: _____

(Textbook Section 6.1)

For each situation below, identify the slope and *y*-intercept in the equation and explain what each of them represents in the context of the problem.

1) Money earned in a walk-a-thon where $t(m)$ = total raised and *m* = number of miles walked: $t(m) = 2m$

slope (*m*) = _____ y-intercept (*b*) = _____

Represents:

2) Money left on a gift-card where $A(v)$ = amount of gift card and *v* = number of visits: $A(v) = 100 - 10v$

slope (*m*) = _____ y-intercept (*b*) = _____

Represents:

3) Calories burned in a workout where $c(m)$ = total calories burned and *m* = number of minutes worked out: $c(m) = 215 + 3.8m$

slope (*m*) = _____ y-intercept (*b*) = _____

Represents:

4) Height in a building while riding an elevator down where $h(f)$ = current height and f = number of floors traveled down : $h(f) = 321 - 13f$

slope (*m*) = _____ y-intercept (*b*) = _____

Represents:

5) Earnings from mowing lawns where *y* = money earned and *x* = number of lawns mowed: $y = -300 + 15x$

slope (*m*) = _____ y-intercept (*b*) = _____

Represents:

6) **Canoe Caper:** While your family is visiting Deep Creek Lake, you and your brother decide to go boating. The park rangers require a $25.00 deposit to rent a canoe and a rental fee of $6.50 per hour.

a) Write a linear function in which $c(h)$ represents the total cost of renting the canoe and h represents the number of hours. _____

b) Identify the slope and *y*-intercept in the equation and explain what each of them represents in the context of the problem.

slope (*m*) = y-intercept (*b*) =

c) Graph the linear equation.

a) Find the cost of renting a canoe from 12:30 to 3:30 PM provided that the canoe is returned in the same condition in which you received it. Use mathematics to explain how you got your answer. Use words, symbols, or both.

Cost: _____.