Problem Set #3.4 - Real World Problems with Linear Equations

Name: _____ Class: _____

1.) Montana and Robby each have a coin bank. Montana starts with a certain amount of money and adds money at regular intervals. Montana starts with a different amount of money and takes money out over time. The amount of money, y, dollars, in Montana's coin bank after x weeks is given by the equation $y = -24x + 120$. The graph shows the amount of money in Robby's coin bank after x week.
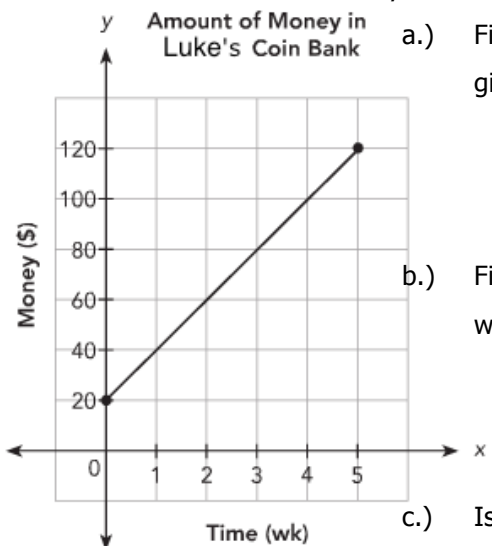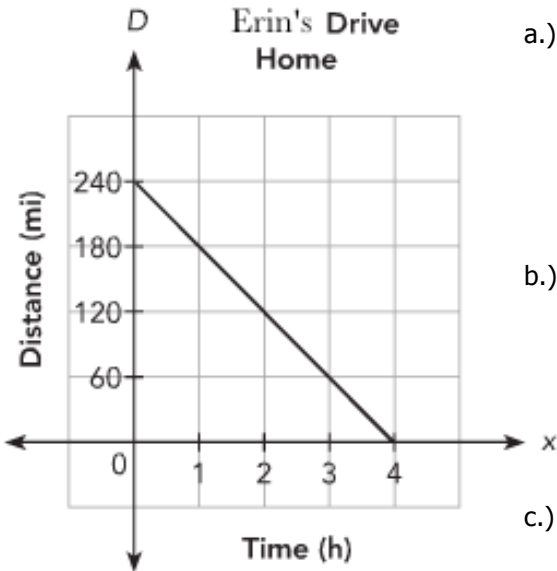

a.) Find the vertical intercept of Robby's graph and explain what information it gives about the situation.

b.) Find the slope of Robby's graph and explain what information it gives about with situation.

c.) Is Robby adding money at a faster rate or is Montana taking out money at a faster rate? Explain.

2.) Both Peter and Alex are salespeople. Each of them earns a fixed monthly salary and a percent commission based on the total sales he makes in a week. The graph shows the total earnings, E dollars, each person can make in one week, based on the person's total sales, S dollars.
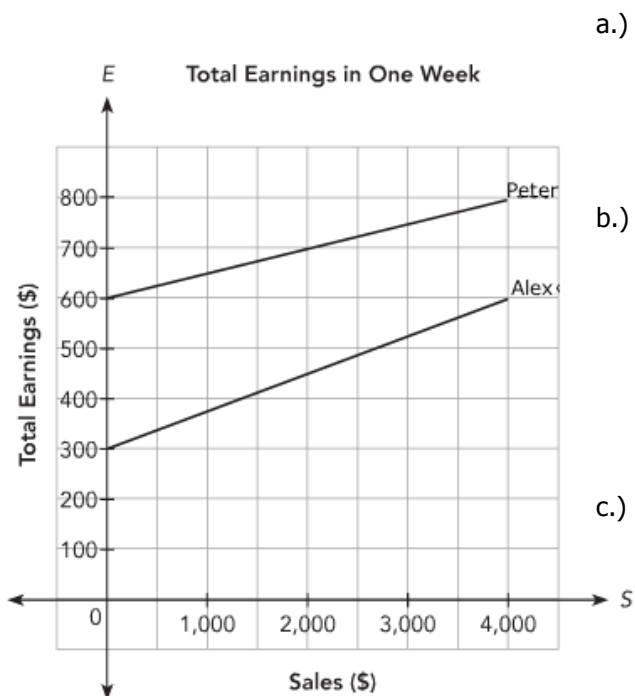
a.) Find the fixed monthly salary for each person.

b.) Both Peter and Alex earn a percent commission. Who earns more in commission?

c.) Find each person's commission.

3.) Mirka and Erin are roommates, but go to different cities for vacation. When their vacation is over, they begin driving back home at the same time, but drive home at different speeds. Mirka's distance D miles from their house x hours after she starts driving is given by the equation $D = -50x + 150$. The graph shows Erin's distance D miles from their house, h, hours after she starts driving home.


Erin's Drive Home

a.) Find the vertical intercept of Erin's graph and explain what information it gives about the situation.

b.) Find the slope of Erin's graph and explain what information it gives about the situation.

c.) Which roommate is driving faster? How do you know?

4.) Nick pays a fixed amount each month to use his cell phone. He also pays for each minute that he makes calls on the phone. The graph shows the amount, C, dollars he pays in a given month, based on the airtime, x minutes, he uses to make calls.
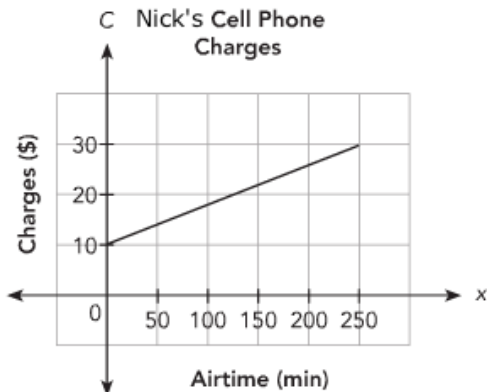
a.) Find the vertical intercept of the graph and explain what information it gives about the situation.

Nick's Cell Phone Charges

b.) Find the slope of the graph and explain what information it gives about the situation.

5.) Mason and Jack both have a coin bank. In January, they had different amounts of money in their coin banks. Then, for each month after that, they both added the same amount of money to their coin bank. The graph shows the amount of savings, S dollars, in each coin bank after t months.
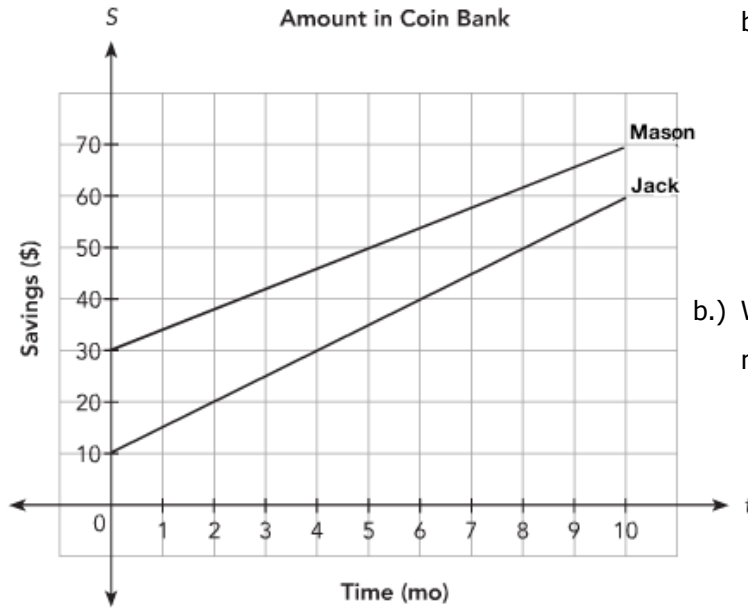
a.) Find the initial amount of money in each coin bank.

Amount in Coin Bank

Mason

Jack

Savings ($)

Time (mo)

b.) Who added a greater amount of money each month into his coin bank? Explain how you know.


6.) Muira and Justin drive from Town A to Town B in separate cars. The initial amount of gasoline in each car is different. The graphs show the amount of gasoline, y gallons, in each person's car after x miles.

a.) Find the initial amount of gasoline in each car.

Gasoline Use

Amount of Gasoline Left (gal)

Muira

Justin

Distance From Town A (mi)
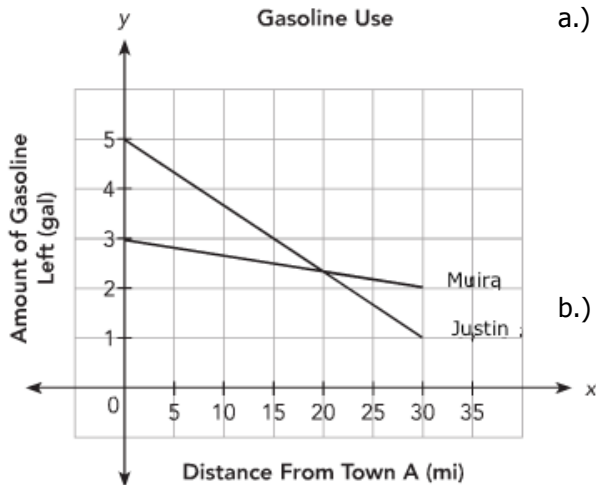
b.) How many miles per gallon does each car get?

7.) Payton and Carly visit Star Café every day and they pay for the items using a gift card. The amount, *y* dollars, on Carly's gift card after *x* days is given by the equation $y = 100 - 19x$. The graph shows the amount on Payton's gift card over *x* days.

y Amount Left on Payton's
Gift Card

Amount ($)

80
70
60
50
40
30
20
10

0 1 2 3 4 5 →x

Time (days)
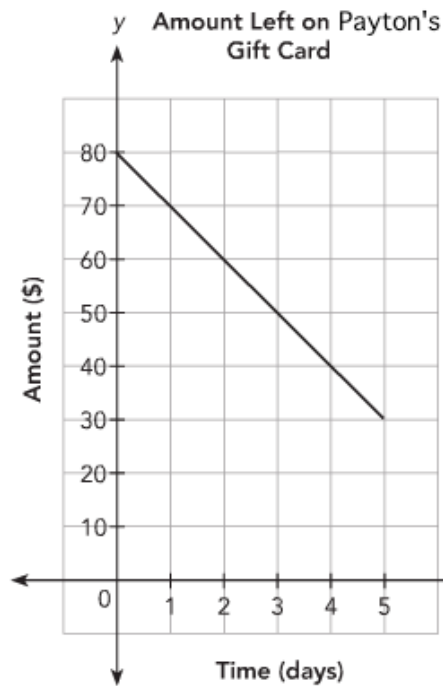
a.) Write an equation for the amount on Payton's gift card.

b.) Using your answer in a, whose gift card has a higher initial amount? Explain how you know.

c.) Using your answer in a, who spends more each day? Explain how you know.

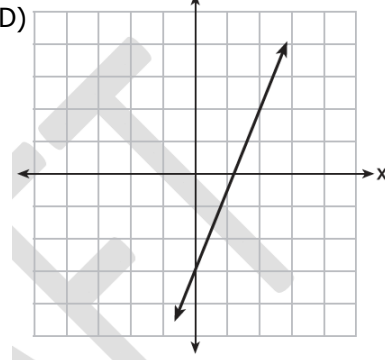8.) Of the four linear functions represented below, which has the greatest rate of change?

(A) A number, *y* is two less than twice a number, *x*.

(C) $3y = 4x + 3$

(B)

| x	h(x)
−6	−10
−3	−3
3	11

(D)

9.)   A scientist attaches a spring that is 11 inches long to the ceiling and hangs weights from the spring to see how far it will stretch. The scientist records the length of the spring, *y* inches, for different weights *x* points.

Weight (x pounds)	0	1	2	3	4
Length of Spring (y inches)	11	13	15	17	19

a.) Graph the relationship between the length of the spring fo different weights.

11 in.
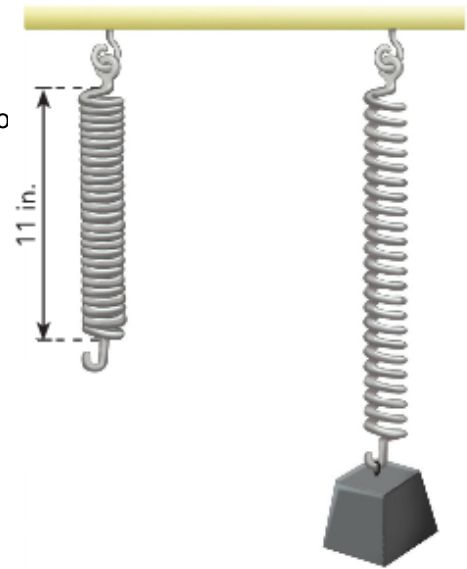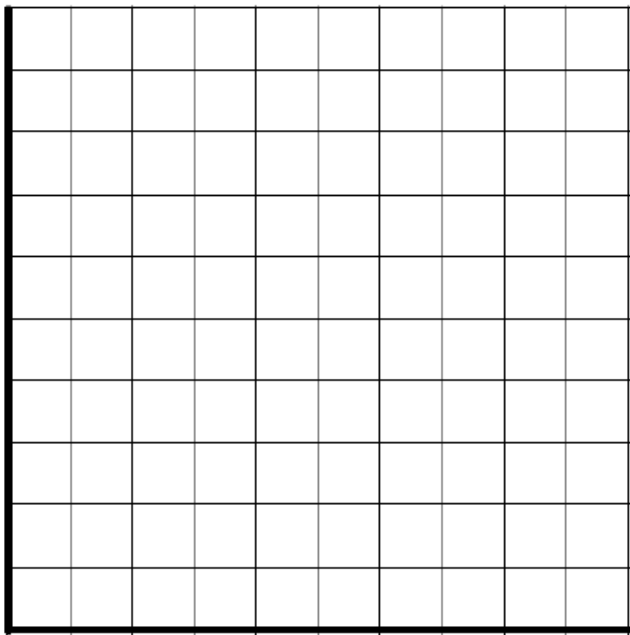
b.) Find the vertical intercept of the graph and explain what information it gives about the situation.

c.) Find the slope of the graph and explain what information it gives about the situation.

d.) Write an equation relating the spring stretch length and the pounds of weights hung from the spring.

e.) Use your equation to determine the spring stretch length if a weight of 9 pounds is hung from the spring.