P.S. #5.6 - Applications of Systems of Equations

Name: _____ Class: _____

1.) Clarita's favorite activities are bike riding and dancing. She wants to try to do these activities for 6 hours each week. She would also like to try to burn off about 2,100 calories a week. She finds that biking uses about 425 calories each hour and dancing uses about 325 calories each hour. She wants to do bike riding for x hours and dancing for y hours each week. How much time should she spend doing each activity to accomplish her goal?

(Just do the set-up. Do not solve.)

2.) Gage purchased 12 pens and 14 notebooks for $20. Mike bought 7 pens and 4 notebooks for $7.50. Find the price of one pen and the price of one notebook, algebraically.

(Just do the set-up. Do not solve.)

3.) When Sabrina received her weekly allowance, she decided to purchase candy bars for all her friends. She bought three Milk Chocolate bars and four Creamy Nougat bars, which cost a total of $4.25 without tax. Then, she realized this candy would not be enough for all her friends, so she returned to the store and bought an additional six Milk Chocolate bars and four Creamy Nougat bars, which cost a total of $6.50 without tax. How much did *each* type of candy bar cost?

(Just do the set-up. Do not solve.)

4.) The difference between the length and width of one face of a box is 4 inches. The face has a perimeter of 52 inches. Find the length and width.

5.) A farmer has only chickens and cows in her barnyard. If the animals in her barnyard have a total of 60 heads and 140 legs, how many chickens and how many cows are in the backyard?

6.) The movie, *The Interview,* generated rough $15 million in online sales and rentals during its first four days of availability, Sony Pictures said on Sunday. Sony did not say how much of that total represented $6 digital rentals versus $10 sales. The studio said there were about two million transactions over all. How many were digital rentals and how many were online sales?

7.) Tori has $110 and Jordan has $600 in their bank accounts. Tori's account balance increases by $30 every year and her account balance will be *C* dollars in *x* years. Jordan's account balance reduces by $40 every year and her account balance will also be *C* dollars in *x years.*

a. Write two equations of C in terms of x.

b. Solve this system of linear equations to find the amount in the girls' account balances when they are equal.

8.) Clarita decides to join a gym. At this gym, there is a membership fee, plus a monthly fee. She pays $226 after 3 months and $394 after 7 months.

a.) Write an equation to relate the cost, C, to the number of months, m.

b.) What is the monthly fee? _____
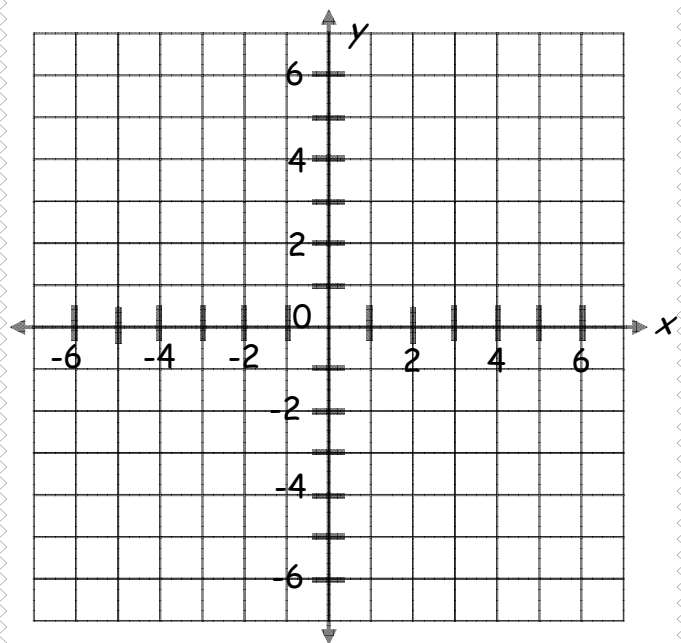
c.) What is the initial fee? _____

d.) Find the amount she would have to pay after 12 months.

9.) Solve the following system of equations using all three methods.

$$4y - x = -8$$
$$3y + 6x = 21$$

Graphically

Substitution

Elimination

Answers:

4.) length = 15 in, width = 11 in.

5.) 10 cows, 50 chickens

6.) 1,250,000 digital rentals and 750,000 online sales

7.) $320

8.) $C = 42m + 100$

9.) (4,-1)