Geometry Lomac 2015-2016	Date 10/30 due 11/2	Modeling with Systems of Equations Day 2	4.3L

Name _____ **Per**_____

LO: I can write systems of equations to represent situations and solve the systems to answer questions about the situation.

emath 5.5

☐ **DO NOW** On the back of this packet

☐ **(1) Systems and the graphing calculator**

As we have mentioned, there are many different ways to solve equations, i.e. find the value(s) of the variable(s) that result in the equation being true. One of the **algebraic** methods that we've seen is to use inverse operations to undo what has been done to the variable. Other sub-methods involve writing equivalent expressions and manipulating the equation with the properties of equality. Today we will see how to solve equations by using graphs (primarily created on our calculator).

Exercise #1: Consider the equation $3x - 2 = 10 - x$.

(a) Solve this equation using standard methods and then show it is a solution by checking.

(b) Using your calculator, fill out the table below for the two expressions. Circle the solution you found in (a).

x	0	1	2	3	4
$3x - 2$					
$10 - x$					

(c) Using your calculator, sketch a graph of the two lines $y = 3x - 2$ and $y = 10 - x$ on the axes below. Use a **WINDOW** of $-2 \le x \le 6$ and $-2 \le y \le 11$. Use your calculator to find their intersection point.
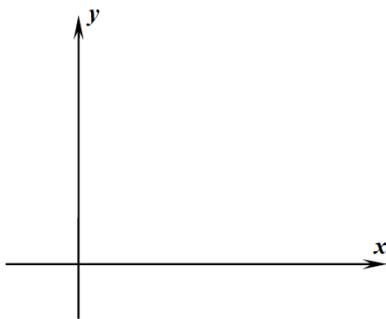
(d) **Fill in the blanks:**

To solve the equation $f(x) = g(x)$ you _____ both $f(x)$ and $g(x)$ and then find the _____ point(s) of their graphs.

(2) **Systems and situations**

Guy and Jim work at a furniture store. Guy is paid $185 per week plus 3% of his total sales in dollars, x, which can be represented by $g(x) = 185 + 0.03x$. Jim is paid $275 per week plus 2.5% of his total sales in dollars, x, which can be represented by $f(x) = 275 + 0.025x$. Determine the value of x, in dollars, that will make their weekly pay the same.

☐ (3) **Systems and Situations**

During the 2010 season, football player McGee's earnings, m, were 0.005 million dollars more than those of his teammate Fitzpatrick's earnings, f. The two players earned a total of 3.95 million dollars. Which system of equations could be used to determine the amount each player earned, in millions of dollars?

1    $m+f=3.95$

$m+0.005=f$

2    $m-3.95=f$

$f+0.005=m$

3    $f-3.95=m$

$m+0.005=f$

4    $m+f=3.95$

$f+0.005=m$

☐ (4)   **Systems and Situations**

Jacob and Zachary go to the movie theater and purchase refreshments for their friends. Jacob spends a total of $18.25 on two bags of popcorn and three drinks. Zachary spends a total of $27.50 for four bags of popcorn and two drinks. Write a system of equations that can be used to find the price of one bag of popcorn and the price of one drink. Using these equations, determine and state the price of a bag of popcorn and the price of a drink, to the *nearest cent.*

☐ (5) **Exit Ticket**

ON THE LAST PAGE

☐ (6) **Homework**

(1) An animal shelter spends $2.35 per day to care for each cat and $5.50 per day to care for each dog. Pat noticed that the shelter spent $89.50 caring for cats and dogs on Wednesday. Write an equation to represent the possible numbers of cats and dogs that could have been at the shelter on Wednesday. Pat said that there might have been 8 cats and 14 dogs at the shelter on Wednesday. Are Pat's numbers possible? Use your equation to justify your answer. Later, Pat found a record showing that there were a total of 22 cats and dogs at the shelter on Wednesday. How many cats were at the shelter on Wednesday?

Homework

(2) A local business was looking to hire a landscaper to work on their property. They narrowed their choices to two companies. Flourish Landscaping Company charges a flat rate of $120 per hour. Green Thumb Landscapers charges $70 per hour plus a $1600 equipment fee. Write a system of equations representing how much each company charges. Determine and state the number of hours that must be worked for the cost of each company to be the same. [The use of the grid below is optional.] If it is estimated to take at least 35 hours to complete the job, which company will be less expensive? Justify your answer.
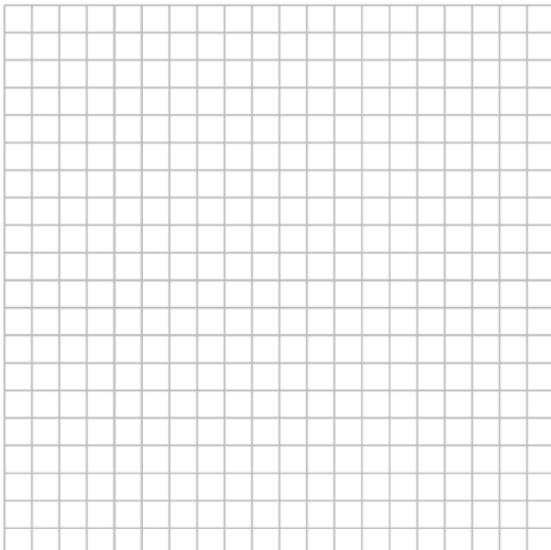
☐ (6)   **Homework**
cont.
(3)

Next weekend Marnie wants to attend either carnival A or carnival B. Carnival A charges $6 for admission and an additional $1.50 per ride. Carnival B charges $2.50 for admission and an additional $2 per ride.

a) In function notation, write $A(x)$ to represent the total cost of attending carnival A and going on x rides. In function notation, write $B(x)$ to represent the total cost of attending carnival B and going on x rides.

b) Determine the number of rides Marnie can go on such that the total cost of attending each carnival is the same. [Use of the set of axes below is optional.]

c) Marnie wants to go on five rides. Determine which carnival would have the lower total cost. Justify your answer.
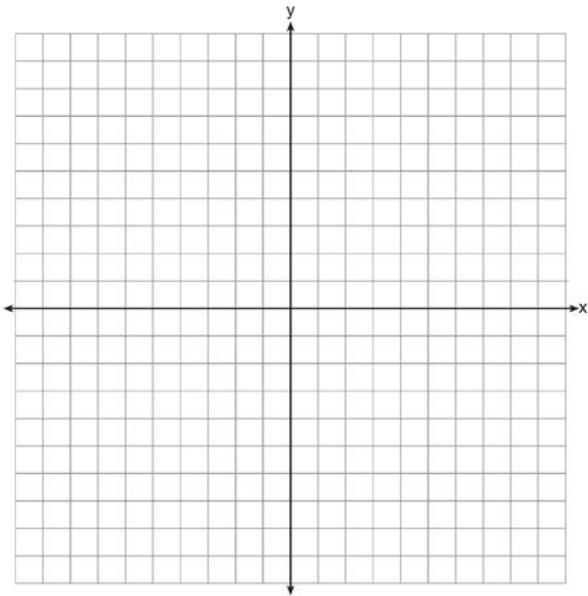
Exit Ticket　　**Name**_____　**Date**_____　**Per**_____　　**4.3L**

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

Do the problem below:

Mo's farm stand sold a total of 165 pounds of apples and peaches. She sold apples for $1.75 per pound and peaches for $2.50 per pound. If she made $337.50, how many pounds of peaches did she sell?

DO NOW   Name_____ Date _____ Per_____   4.3L

(1) Solving progress: Solve one of the two problems below.

(a) $\dfrac{5}{6}(12p + 4) = -13p + 4$ (b) $2(2x - 5) = 6x + 4$

(2) Translation to algebra progress. Write an algebraic statement to represent this situation. Be sure to write a "Let"

statement to define any variables.

Container A has 200 L of water, and is being filled at a rate of 6 liters per minute. Container B has 500 L of water,

and is being drained at 6 liters per minute. How many minutes, m , will it take for the two containers to have the

same amount of water?