Writing Systems of Equations

Agenda

Warm-up
HW Check
Notes
Matching
HW: Practice #1 - 6

Reminders

ELA Test tomorrow!

Essential Question

How do I translate words into a system of equations?

Warm-Up

1. ~~During the second week of winter break, Emily practiced her oboe~~ for 10 minutes less than twice the amount of time she practiced the first week. If she practiced m minutes the first week, which expression represents the number of minutes Emily practiced during the second week?

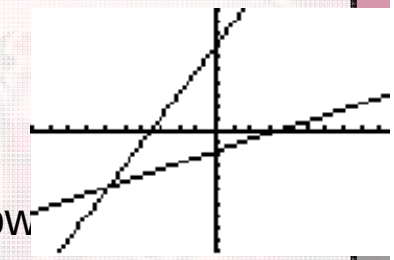
A. 2 - 10m

B. 10 - 2m

C. 2m - 10

D. 10m - 2

$2m - 10$



2. How many solutions does the follow system of equations have? Justify your answer.

① $2x - 4y = 7$

$-2x \quad -2x$

② $y = 2x + 7$

$m = 2$

SOLVE FOR Y

$\frac{-4y}{-4} = \frac{-2x}{-4} + \frac{7}{-4}$

$y = \frac{1}{2}x - \frac{7}{4}$

$m = \frac{1}{2}$

one solution

Algebra I – Unit 6: Topic 1 – Intro to Systems

Practice – Intro to Systems **No textbook correlation**

Name _____ Date _____ Period _____

Determine if the given point is a solution to the equation.

1. $(-3, 6)$ $2x - y = -12$
$3x + 2y = -3$

2. $(-1, -4)$ $3y = x - 11$
$2x + y = -2$

x y

① $3(-4) \stackrel{?}{=} (-1) - 11$
$-12 = -12$ ✓

② $-2(-1) + (-4) \stackrel{?}{=} -2$
$-2 = -2$ ✓

$x = -1$
$y = -4$

yes

3. $(4, 1)$ $x + 2y = 6$
$x - y = 3$

4. $(2, 1)$ $2x - 5y = -1$
$3x - 4y = -2$

Determine the number of solutions for each system. Write "one", "none" or "infinite".

5. $y = \frac{2}{3}x - 5$
$3y = 2x$

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

7. $x + 2y = 5$
$2x + 4y = 2$

WRITING SYSTEMS OF EQUATIONS P. 77

ESSENTIAL QUESTION How do I translate words into a system of equations?

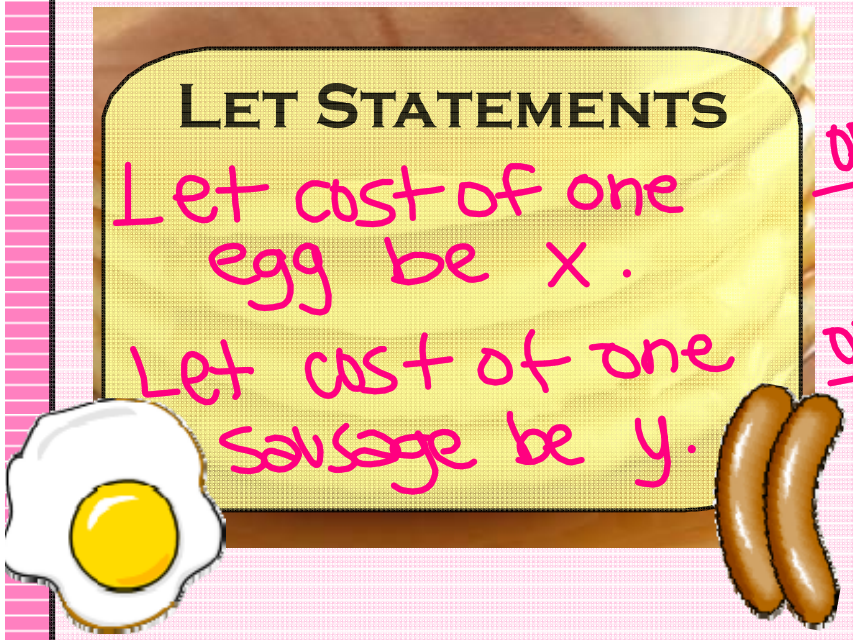
TIPS FOR WRITING A SYSTEM FROM A WORD PROBLEM

1. Find & [illegible] variables
2. Write Let Statements (which letter stands for what thing)
   define variables
3. Determine "Types" of equations. 2 equations
   - money & number
     $ + $ = $ 1st type + 2nd type = total
   - two people/two menu options
     ex. Jim & Bob
   - special rule & total (perimeter)
4. Remember key words page 7
   - is — equals
   - less than — flips around
   - each — multiply

WRITING SYSTEMS OF EQUATIONS P. 77

ESSENTIAL QUESTION How do I translate words into a system of equations?

1. A breakfast menu lists 2 eggs with 1 sausage patty for $2.23 and 3 eggs with 2 sausage patties for $3.76. Set up a system of equations that will determine the [illegible] and [illegible].



OPTION 1 $2x + 1y = 2.23$

OPTION 2 $3x + 2y = 3.76$

WRITING SYSTEMS OF EQUATIONS P. 77

ESSENTIAL QUESTION How do I translate words into a system of equations?

2. A rectangular flower patch has a perimeter of 48 feet. The length of the garden is 2 feet more than twice the width. Set up the system of equations that will determine the [illegible] and the [illegible] of the flower patch.

LET STATEMENTS

l = length

w = width

perimeter $2l + 2w = 48$

special rule $l = 2 + 2w$

WRITING SYSTEMS OF EQUATIONS P. 77

ESSENTIAL QUESTION How do I translate words into a system of equations?

3. ~~Suppose you are collecting tickets at a football game.~~ [redacted] cost $4 each and [redacted] costs $3 each. After the game is over, the turnstile count shows that 1787 people paid admission. You count a total of $5792 from the sale of tickets. ~~You are just about ready to leave for your postgame date when your boss says, "By the way, how many of each kind of ticket were there?" Rather than spending half an hour sorting and counting all the ticket stubs you decide to use algebra. Set up a system of equations that will help you determine the number.~~

LET STATEMENTS

Let R be reserved tickets.

Let G be general admission tickets.

money $\quad \overset{\$}{4R} + \overset{\$}{3G} = \overset{\$}{5792}$

number $\quad \underset{\text{1st type}}{R} + \underset{\text{2nd type}}{G} = \underset{\text{total}}{1787}$

WRITING SYSTEMS OF EQUATIONS P. 77

ESSENTIAL QUESTION How do I translate words into a system of equations?

Systems Card Match

Match the correct system of equations with the word problems below. Don't forget your let statements! Try to write the system first, then find the appropriate card. Make sure you highlight/underline important words and phrases.

Due by the end of the period!

Algebra I – Unit 6: Topic 1 – Intro to Systems

Practice – Writing Systems of Equations **No textbook correlation**

Name _____ Date _____ Period _____

Write the Let Statements and derive a system of equations that could be used to solve each problem.

1. The admission fee at a small fair is $1.50 for children and $4.00 for adults. On certain day, 2200 people enter the fair and $5050 is collected. How many children and how many adults attended?

   Let Statements

2. The treasurer of the student body at a college reported that the receipts from a recent concert totaled $916. Furthermore, he announced that 560 people had attended the concert. Students were charged $1.25 each for admission to the concert, and adults were charged $2.25 each. How many adults attended the concert?

   Let Statements

3. Elle went to Pet Smart and bought 4 goldfish and 3 turtles for $28. Later that day, Warren went to Pet Smart and bought 6 goldfish and 1 turtle for $10. How much does 1 goldfish cost?

   Let Statements

4. The perimeter of a rectangle is 40. The width is four less than 5 times the length. Find the dimensions of the rectangle.

   Let Statements

5. The school track team earned $2 for every hat they sold and $5 for every sweatshirt they sold. The total profits were $317. If they sold 1 more of the hats than of the sweatshirts, which system could be used to find how many sweatshirts they sold?

   Let Statements

6. A boy has seven more nickels than quarters. The total value of the coins is $4.90. Which system could be used to find how many nickels and quarters he has?

   A $\begin{matrix} n = 7 + q \\ 0.05n + 0.25q = 4.90 \end{matrix}$ B. $\begin{matrix} n = 7q \\ n + q = 4.90 \end{matrix}$ C. $\begin{matrix} q = 7 + n \\ 0.05n + 0.25q = 4.90 \end{matrix}$ D. $\begin{matrix} n = 7 + q \\ n + q = 4.90 \end{matrix}$

Nickel .05

Writing Systems of Equations HW Help

Variables may vary based on your let statements!
Which equation comes first also does not matter.

1. Let c be children
   Let a be adults
   $1.50c + 4.00a = 5050$
   $c + a = 2200$

2. Let x be students
   Let y be adults
   $x + y = 560$
   $1.25x + 2.25y = 916$

3. Let g be goldfish
   Let t be turtles
   $4g + 3t = 28$
   $6g + 1t = 10$

4. Let l be length
   Let w be width
   $2l + 2w = 40$
   $w = 5l - 4$

5. Let h be hats
   Let s be sweatshirts
   $2h + 5s = 317$
   $h = s + 1$

6. A

Get one wrong? Drop by tutorials!!