

Objective: SWBAT read a real world word problem and write a system of equations to model the given information, then solve it.

Lesson 25: Word Problems and Systems of Equations

Date: November 9, 2015

$$y = 3(-3) + 3$$
$$-9 + 3$$

Warm Up:

Solve the following systems using any method you see fit.

1. $4x + 8y = -16$ $(6, -5)$
 $-4x - 4y = -4$

$$\begin{array}{r} 4y = -20 \\ \hline 4 \end{array}$$
$$y = -5$$
$$4x + 8(-5) = -16$$
$$4x - 40 = -16$$
$$4x = 24$$
$$x = 6$$

2. $y = 3x + 3$
 $2x - 3y = 12$

$$2x - 3(3x + 3) = 12$$
$$2x - 9x - 9 = 12$$
$$-7x - 9 = 12$$
$$-7x = 21$$
$$x = -3$$

$$y = 6$$

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How would we set up the following word problems as a linear equation?

A candy company charges \$12 per pound of candy, plus \$6 for shipping. Write an equation to model the total amount spent.

$$12p + 6$$

$$y = 12x + 6$$

Max sells lemonade for \$2 a cup, and candy for \$1.50 per bar. He earns \$425 selling lemonade and candy. Write an equation to model how much lemonade and candy is sold.

$$2y + 1.50x = 425$$

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Writing systems of linear equation is similar. The difference is, we will write 2 equations, that are related to each other.

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When setting up a system of equations from a word problem you should follow these steps:

1. Underline what is important in the problem
2. Identify what you will use as variables (it is best to use letters that represent what the problem is about)
3. Remember you need to write two equations since this is about systems
4. Solve the system (remember answer will be (x, y) form)

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Dre and Victor are selling cheese cakes for a school fundraiser. Customers can buy New York style cheese cakes and strawberry cheesecakes. Dre sold 10 New York and 5 strawberry for a total of \$130. Victor sold 5 New York and 5 strawberry for a total of \$100. What is the cost of one New York style and one strawberry?

N = NY
S = Strawberry

$$\begin{array}{r} -1(10N + 5S = 130) \\ 5N + 5S = 100 \\ \hline -10N - 5S = -130 \\ \hline -5N = -30 \\ \hline -5 \quad -5 \\ \hline N = 6 \end{array}$$

$$\begin{array}{r} 10(6) + 5S = 130 \\ 60 + 5S = 130 \\ \hline -60 \quad -60 \\ \hline 5S = 70 \\ \hline 5 \quad 5 \\ \hline S = 14 \end{array}$$

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Ren and Austin each improved their yards by planting rose bushes and ivy. They bought their supplies from the same store. Ren spent \$94 on 7 rose bushes and 6 pots of ivy. Austin spent \$90 on 7 rose bushes and 5 pots of ivy. Find the cost of one rose bush and one pot of ivy.

R = roses
P = pots of ivy

$$\begin{array}{r}
 -1(7r + 6p = 94) \\
 7r + 5p = 90 \\
 \hline
 -7r - 6p = -94 \\
 \hline
 -1p = -4 \\
 \hline
 p = 4
 \end{array}$$

$$\begin{array}{r}
 7r + 6(4) = 94 \\
 7r + 24 = 94 \\
 -24 \quad -24 \\
 \hline
 7r = 70 \\
 \hline
 r = 10
 \end{array}$$

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Brenda's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 2 adult tickets and 6 child tickets for a total of \$44. The school took in \$58 on the second day by selling 4 adult tickets and 6 child tickets. What is the price each of one adult ticket and one child ticket?

$$A = 7$$

$$C = 5$$