Solving Systems by Elimination

Agenda

Warm-Up

Notes p.80-81

HW: #1 - 9

Reminders

Quiz Friday

PM Tutoring - TODAY, not Wednesday

Essential Question

How do I find the solution a system using elimination?

Turn in "Valentine's Day" RIGHT NOW!!

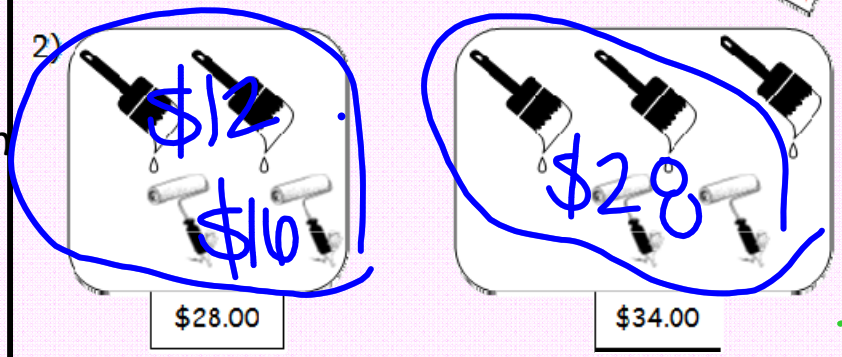
Warm-Up Tuesday

Using the following pictures, try to figure out the cost of each item. Then explain the process that you used to find the solution.

1)

Popcorn $2
HotDog $3

2)



Brush $6
Roller $8

$2x+2y=28$
$3x+2y=34$

Solving Systems by Elimination p.80

Essential Question How do I find the solution a system using elimination?

Mathematics of Life

$$\begin{array}{rl} \text{Life} + \cancel{\text{Love}} & = \text{Happy} \\ + \text{Life} - \cancel{\text{Love}} & = \text{Sad} \\ \hline 2\ \text{Life} & = \text{Happy} + \text{Sad} \end{array}$$

$$\therefore \text{Life} = \frac{\text{Happy} + \text{Sad}}{2}$$

$$\therefore \text{Life} = \tfrac{1}{2}\,\text{Happy} + \tfrac{1}{2}\,\text{Sad}$$

That's Real Life. Enjoy It.

Solving Systems by Elimination p.80

Essential Question How do I find the solution a system using elimination?

Solve each system of equations by elimination. Write your answer as an ordered pair (x,y).

EQUAL but OPPOSITE

1. $3x - 2y = 19$
$5x + 4y = 17$

$2(3x - 2y = 19)$

$6x - 4y = 38$
$+\ 5x + 4y = 17$

$\frac{11x}{11} = \frac{55}{11}$

$x = 5$

y is opposite but not = MULTIPLY top by 2

$3(5) - 2y = 19$
$15 - 2y = 19$
$-15 \quad -15$
$\frac{-2y}{-2} = \frac{4}{-2}$
$y = -2$

$(5, -2)$

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

$\frac{3y}{3} = \frac{9}{3}$

$y = 3$

Plug in $y = 3$
$x + 2(3) = 5$
$x + 6 = 5$
$-6 \quad -6$
$x = -1$

$(-1, 3)$

3. $3x + y = 5$
$2x + y = 10$

y's equal but not opposite → multiply by -1

$-3x - y = -5$
$+\ 2x + y = 10$

$\frac{-1x}{-1} = \frac{5}{-1}$

$x = -5$

$2(-5) + y = 10$
$-10 + y = 10$
$+10 \quad +10$
$y = 20$

$(-5, 20)$

4. $4x + y = 6$
$6x + y = 20$

change eliminate y

$-20x - 35y = -30$
$+\ 42x + 35y = 140$

$\frac{22x}{22} = \frac{110}{22}$

$x = 5$

$6(5) + 5y = 20$
$30 + 5y = 20$
$-30 \quad -30$
$\frac{5y}{5} = \frac{-10}{5}$

$(5, -2)$

5. $-12x + 5y = -5$
$9x - 15y = 6$

6. $4x - 3y = 12$
$3y - 4x = -12$

Rearrange
x y
x y

$4x - 3y = 12$
$+\ -4x + 3y = -12$

$0 = 0$
TRUE

infinite solutions

Solving Systems by Elimination p.80

Essential Question How do I find the solution a system using elimination?

7. The equation of two lines are $3x - 5y = -35$ and $-2x + 5y = 30$. What is the value of y in the solution for this system of equations?

Line up!

$$3x - \cancel{5y} = -35$$
$$-2x + \cancel{5y} = 30$$
$$x = -5$$

$$3(-5) - 5y = -35$$
$$-15 - 5y = -35$$
$$+15 \qquad +15$$
$$\frac{-5y}{-5} = \frac{-20}{-5}$$
$$\boxed{y = 4}$$

8. David and Jose went to Target to buy clothes. David bought two shirts and one pair of jeans for \$53.50. Jose bought two shirts and three pairs of jeans for \$108.50. How much is one pair of jeans?

x = shirts
y = jeans

$$2x + y = 53.50$$
$$-1(2x + 3y = 108.50)$$
$$\cancel{2x} + y = 53.50$$
$$-\cancel{2x} - 3y = -108.50$$
$$\frac{-2y}{-2} = \frac{-55}{-2}$$
$$y = \$27.50$$

On the next page in your notebook (p.81), write or draw out the steps to solve a system by <u>elimination</u>. Your steps should include an example and COLOR.

HW 2

example

$3x + y = -6$

$5x + y = -10$

① Rearrange

② change

(equal but opposite)

③ add together

④ Solve

⑤ plug into original

Algebra I - Unit 6: Topic 2 – Solving Systems by Elimination

Practice – Solving Systems by Elimination **pp 397-403**

Name _____ Date _____ Period_____

Solve each system by elimination.

1. $2x + y = 3$
   $-2x + 5y = -9$

2. $3x + y = -6$
   $5x + y = -10$

3. $\frac{1}{2}x - 5y = 30$
   $\frac{1}{2}x + 7y = 6$

4. $5x - 2y = 4$
   $3x + y = 9$

5. $3x - 5y = 13$
   $x - 2y = 5$

6. $4x + 3y = 9$
   $3x + 4y = 12$

Algebra I - Unit 6: Topic 2 – Solving Systems by Elimination

7. Three hundred fifty-eight tickets were sold to the school basketball game on Friday. Student tickets were $1.50 and non-student tickets were $3.25. The school made $752.25. How many student and non-student tickets were sold?

Let Statements

8. Naomi took a 40-question history exam. The exam only had multiple-choice questions and short-answer questions. Each multiple-choice question was worth one point; each short-answer question was worth five points; the whole exam was worth 100 points.

A. Which system of equation could be used to solve for m, the number of multiple-choice questions, and s, the number of short-answer questions?

A $\begin{array}{l} 5m + s = 40 \\ m + s = 100 \end{array}$

C $\begin{array}{l} s + m = 40 \\ 5s + m = 100 \end{array}$

B $\begin{array}{l} m + s = 40 \\ 5m + s = 100 \end{array}$

D $\begin{array}{l} 5s + m = 40 \\ s + m = 100 \end{array}$

B. Solve the system that you selected in part A.

9. Karrie and Amy were shoulder partners. They both worked the same problem, but got two different answers. Who is incorrect and explain the error they made?

Karrie:

$x + y = -3 \longrightarrow$
$3x + y = 3 \longrightarrow$

$$\begin{array}{r} x + y = -3 \\ -(3x + y = 3) \\ \hline -2x = 0 \\ x = 0 \end{array}$$

When she solved for x, Karrie got $x = 0$

Amy:

$x + y = -3 \longrightarrow$
$3x + y = 3 \longrightarrow$

$$\begin{array}{r} x + y = -3 \\ -(3x + y = 3) \\ \hline -2x = -6 \\ x = 3 \end{array}$$

When she solved for x, Amy got $x = 3$

Solving Systems by Elimination HW Help

Essential Question How do I find the solution a system using elimination?

1. (2, -1). The x's cancel immediately.

2. (-2, 0). Change ALL the signs in one equation so that the y's cancel.

3. (40, -2). Change ALL the signs in one equation so that the x's cancel.

4. (2, 3). Multiply ALL of the 2nd equation by 2 to cancel the y's.

5. (1, -2). Multiply ALL of the 2nd equation by -3 to cancel the x's.

6. (0,3). Multiply the top equation by -3 and the bottom equation by 4 to cancel the x's.

7. Let x be students & y be non-students. $x + y = 358$ and $1.50x+3.25y = 752.25$. Multiply the first equation by -1.50 to cancel x's and solve.

8. C, 15 short answers and 25 multiple choice

9. Try to solve the system yourself!