Solving Systems by Elimination

Agenda

Warm-Up

HW Check

Notes p.52-53

HW: #1 - 11 ODDS

Reminders

Quiz Friday

Essential Question

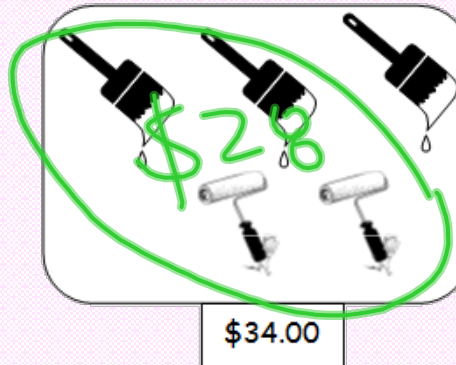How do I find the solution a system using elimination?

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)

$2 $2 $2

$5

$7.00 $5.00

p = popcorn: $2
h = hotdog: $3

$2p + h = 7$
$p + h = 5$

2)

$6 $6 $28

$16

$28.00 $34.00

Brush: $6
Roller: $8

Algebra I - Unit 4: Solving Systems by Substitution Day 2
Practice – Solving Systems by Substitution Day 2
Name _____ Date _____ Period _____

"WHAT DISNEY MOVIE IS ABOUT A STUPID BOYFRIEND?"

Solve the systems of equation using the substitution method. The answer to each problem will match a letter that will allow you to figure out the joke.

1. $2x + 3y = 10$
   $y = -x + 2$

2. $x = 4y - 7$
   $3x = 2y - 1$

3. $6x - y = -4$
   $2x + 2y = 15$

4. $5y - 6 = x$
   $y = -x$

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

6. $x - y = 3$
   $6x + 4y = 13$

7. $6x - 2y = 7$
   $y - 3x = -6$

U. (1, 2)

O. (-5, 0)

B. $(\frac{1}{2}, 7)$

W. (0, 0)

D. (-2, -3) ←

A. (-1, 1)

Y. (-1, 4)

E. (-4, 6) ←

M. (-5, -3)

I. (7, 3)

U. No Solution

N. (-4, 5)

S. (-3, 2)

V. All real number on the line: $y = -\frac{1}{2}x + 3$

B. $(\frac{5}{2}, -\frac{1}{2})$

F. (-3, 13)

8. $x - 7y = 19$
   $5x - 2y = -16$

Handwritten work:

$x - 7y = 19$
$\underline{+7y} \quad \underline{+7y}$
$x = 7y + 19$

$5(7y + 19) = -2y - 16$
$35y + 95 = -2y - 16$
$\underline{+2y} \quad \quad \underline{+2y}$
$37y + 95 = -16$
$\underline{-95} \quad \underline{-95}$
$\frac{37y}{37} = \frac{-111}{37}$
$y = -3$

$x - 7(-3) = 19$
$x + 21 = 19$
$\underline{-21} \quad \underline{-21}$
$x = -2$

$(-2, -3)$
D

___ ___ ___ ___ ___ ___ ___
 8   2   5   1   4   7

Adapted from Nasco's Algebra 1 Joke Worksheets

Solving Systems by Elimination p.52

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

$2 + (-2) = 0$

Mathematics of Life

$$\text{Life} + \text{Love} = \text{Happy}$$
$$+ \; \underline{\text{Life} - \text{Love} = \text{Sad}}$$
$$\frac{2 \text{ Life}}{2} = \frac{\text{Happy} + \text{Sad}}{2}$$

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

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

That's Real Life. Enjoy It.

Solving Systems by Elimination p.52

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

Solve each system of equations by elimination. Write your answer as an <u>ordered pair</u>.

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

   opposite signs
   mult. by #

   $\boxed{(5, -2)}$

   $6x - 4y = 38$
   $+ 5x + 4y = 17$
   $\overline{\dfrac{11x}{11} = \dfrac{55}{11}}$
   $x = 5$

   $3(5) - 2y = 19$
   $15 - 2y = 19$
   $-15 \qquad -15$
   $\dfrac{-2y}{-2} = \dfrac{4}{-2}$
   $y = -2$

2. $x + 2y = 5$
   $+ -x + y = 4$
   $\overline{\dfrac{3y}{3} = \dfrac{9}{3}}$
   $y = 3$

   $\boxed{(-1, 3)}$

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

3. $3x + y = 5$
   $-1(2x + y = 10)$

   same # for y
   multiply by -1

   $\boxed{(-5, 20)}$

   $3x + y = 5$
   $+ -2x - y = -10$
   $\overline{x = -5}$

   $3(-5) + y = 5$
   $-15 + y = 5$
   $+15 \qquad +15$
   $y = 20$

4. $4x + 7y = 6$
   $6x + 5y = 20$

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

6. $4x - 3y = 12$ $4x - 3y = 12$
   $3y - 4x = -12$ $+ -4x + 3y = -12$
   $\overline{0 = 0}$
   TRUE

   $\boxed{\text{infinite solutions}}$

Solving Systems by Elimination p.53

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

1. Rearrange

X's line up
Y's line up

2. Change

"Fair Fight"
equal, signs opposite

multiply everything!

3. Add together

something
should cancel

4. Solve

5. Plug into original

(X, Y)

Solving Systems by Elimination p.52

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?

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?

$$3x - 5y = -35$$
$$-2x + 5y = 30$$

$$x = -5$$

$$-2(-5) + 5y = 30$$
$$10 + 5y = 30$$
$$\underline{-10 \qquad -10}$$
$$\frac{5y}{5} = \frac{20}{5}$$
$$\boxed{y = 4}$$

5 elimination.notebook   **November 10, 2015**

odds   @mskmath

Algebra I - Unit 4: Solving Systems by Elimination Day 1
Practice – Solving Systems by Elimination Day 1
Name _____ Date _____ Period _____

NO WORK = NO CREDIT

Solve each system of equation using elimination.

1.
$$x + y = 5$$
$$3x - y = 7$$

2.
$$3x + 5y = 0$$
$$-2x + 5y = 25$$

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

4.
$$-4x + 6y = -4$$
$$4x - 9y = 5$$

5.
$$3x + 8y = -1$$
$$-3x + y = -17$$

6.
$$2x + y = 5$$
$$-2x - y = 8$$

7.
$$3x + y = -6$$
$$5x + y = -10$$

8.
$$\frac{1}{2}x - 5y = 30$$
$$\frac{1}{2}x + 7y = 6$$

Solve each system of equation using elimination.

9.
$$4x + 7y = -12$$
$$4x + y = 12$$, find x-y

10.
$$x + 2y = 15$$
$$5x - 2y = 3$$, find xy

11. 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
$$5m + s = 40$$
$$m + s = 100$$

C
$$s + m = 40$$
$$5s + m = 100$$

B
$$m + s = 40$$
$$5m + s = 100$$

D
$$5s + m = 40$$
$$s + m = 100$$

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

HW Help: Elimination Day 1 ODDS

No Work = No Credit = No kidding!!!

odd answers only...look at the even solutions for some help!

1. (3,2) Which variable cancels?

3. (2,-1)

5. (5,-2)

7. Multiply one equation by a NEGATIVE (-2,0)

9. 8. Again, multiply by a negative

11. A. C

    B. 15 short answer

       25 multiple choice

even solutions

2. $3x + 5y = 0$
   $-2x + 5y = 25$ $(-5,3)$

$$3x + 5y = 0$$
$$+ 2x - 5y = -25$$
$$\frac{5x}{5} = \frac{-25}{5}$$

$x = -5$ $3(-5) + 5y = 0$
$y = 3$ $-15 + 5y = 0$
          $\frac{5y}{5} = \frac{15}{5}$

4. $-4x + 6y = -4$
  $+ \; 4x - 9y = 5$ $\left(\frac{1}{2}, \frac{-1}{3}\right)$

$$\frac{-3y}{-3} = \frac{1}{-3}$$

$y = \frac{-1}{3}$ $-4x + 6\left(\frac{1}{3}\right) = -4$
        $-4x - 2 = -4$
$x = \frac{1}{2}$ $+2 \quad +2$
        $\frac{-4x}{-4} = \frac{-2}{-4}$

6. $2x + y = 5$
  $+ \; -2x - y = 8$

$$0 \neq 13$$
$$\text{not true}$$
$$\boxed{\text{NO SOLUTION}}$$

8. $\frac{1}{2}x - 5y = 30$
  $+ \; -\frac{1}{2}x + 7y = 6$ $(40, -2)$

$$\frac{-12y}{-12} = \frac{24}{-12}$$

$y = -2$ $\frac{1}{2}x - 5(-2) = 30$
$x = 40$ $\frac{1}{2}x + 10 = 30$
        $-10 \quad -10$
     $2 \cdot \frac{1}{2}x = 20 \cdot 2$
        $x = 40$

10. $x + 2y = 15$
   $+ \; 5x - 2y = 3$, find xy ←multiply
                $(3)(6) \; \boxed{18}$

$$\frac{6x}{6} = \frac{18}{6}$$

$x = 3$ $(3) + 2y = 15$
       $-3 \quad\quad -3$
       $\frac{2y}{2} = \frac{12}{2}$
       $y = 4$

Algebra I - Unit 4: Solving Systems by Elimination Day 1
Practice – Solving Systems by Elimination Day 1

Name _____ Date _____ Period_____

Solve each system of equation using elimination.

1. $x + y = 5$
   $3x - y = 7$

2. $3x + 5y = 0$
   $-2x + 5y = 25$

(-5,3)

$3x + 6y = 0$
$+ 2x - 5y = -25$

$\dfrac{5x}{5} = \dfrac{-25}{5}$

$x = -5$

$y = 3$

$3(-5) + 5y = 0$
$-15 + 5y = 0$
$\dfrac{5y}{5} = \dfrac{15}{5}$

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

4. $-4x + 6y = -4$
   $4x - 9y = 5$

$\left(\dfrac{1}{2}, \dfrac{-1}{3}\right)$

$\dfrac{-3y}{-3} = \dfrac{1}{-3}$

$y = \dfrac{-1}{3}$

$x = \dfrac{1}{2}$

$-4x + 6\left(\dfrac{-1}{3}\right)$
$-4x - 2 = 4$
$+2 \quad +2$
$\dfrac{-4x}{-4} = \dfrac{-2}{-4}$

5. $3x + 8y = -1$
   $-3x + y = -17$

6. $2x + y = 5$
   $-2x - y = 8$

$\pm$

$0 \neq 13$
Not true

NO SOLUTION

7. $3x + y = -6$
   $5x + y = -10$

8. $\dfrac{1}{2}x - 5y = 30$
   $\dfrac{1}{2}x - 7y = 6$

(40, -2)

$\dfrac{-12y}{-12} = \dfrac{24}{-12}$

$y = -2$

$x = 40$

$\dfrac{1}{2}x - 5(-2) =$
$\dfrac{1}{2}x + 10 =$
$-10 \quad -1$
$2 \cdot \dfrac{1}{2}x =$
$x =$

Solve each system of equation using elimination.

9. $4x + 7y = -12$
   $4x + y = 12$, find $x-y$

10. $x + 2y = 15$
    $5x - 2y = 3$, find xy

← multiply

$\pm$

$\dfrac{6x = 18}{6 \quad 6}$

$x = 3$

(3)(6) $\boxed{18}$

$(3) + 2y = 15$
$-3 \qquad -3$

$\dfrac{2y = 12}{}$

$y = 6$

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    $m + s = 100$

C. $s + m = 40$
    $5s + m = 100$

B. $m + s = 40$
    $5m + s = 100$

D. $5s + m = 40$
    $s + m = 100$

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