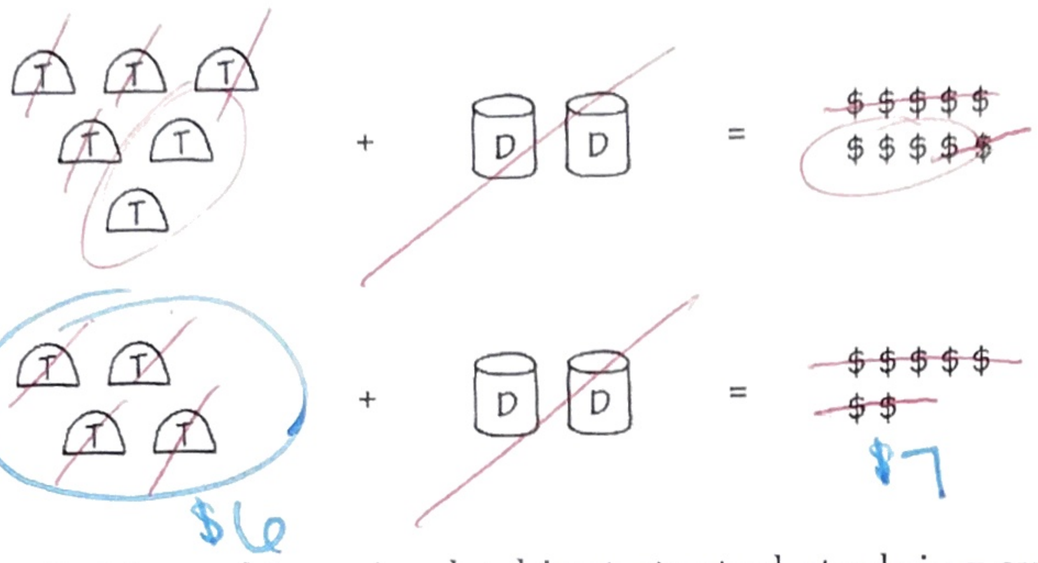
Name: _____ Date: Dec 13 Hour: _Alg 1_

Unit 4 Day 11: Using Elimination to solve a system

Focus Question: How do I use another algebraic method to solve a system?

A. Pablo and his younger brother got 6 tacos and 2 drinks for $10. Jasmine and her brother got 4 tacos and 2 drinks for $7.

Pablo's younger brother Pedro used the orders and total prices to find the price of each taco and each drink. When asked how he figured out the prices, Pedro said, "It's kind of like what we did in school with coins and pouches." Then he made the following sketch.



USE the sketch help you find the price of one taco and the price of one drink?

2 Tacos = $3 ⇒ 1 taco = $1.50

2 drinks = $1 ⇒ 1 drink = $0.50

B. Pablo and Jasmine had just started studying systems of linear equations in algebra. They looked at Pedro's drawing and said, "We could write that as a system of equations."

Let t be the price of each taco and d be the price of each drink.

1. Write an equation that represents the cost of Pablo's order. $6t + 2d = 10$

   Write an equation that represents the cost of Jasmine's order. $4t + 2d = 7$

2. What operation(s) with the equations from part (1) match your way of using Pedro's sketch to find the prices t and d? Subtraction (difference)

   Why do the operations make sense? You found how the orders were different.

3. What does it look like algebraically?

   Option 1: (Which shows what is actually happening)

$4t + 2d = 7$

$4t + 2d - 10 = 7 - 10$

$4t + 2d - (6t + 2d) = -3$

$4t + 2d - 6t - 2d = -3$

$\frac{-2t}{-2} = \frac{-3}{-2}$

$t = \$1.50$

$6(1.50) + 2d = 10$

$9 + 2d = 10$

$-9 \quad -9$

$2d = 1$

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

$d = \$0.50$

   Option 2: (which is easier and most people prefer) STACKING

Elimination or Combination

$$\begin{array}{r} 6t + 2d = 10 \\ -\,(4t + 2d = 7) \\ \hline \frac{2t}{2} = \frac{3}{2} \end{array}$$

$t = \$1.50$

C. In algebra class the next day, Pablo and Jasmine tried to solve the system of linear equations.

$\begin{cases} x + 4y = 11 \\ x + y = 5 \end{cases}$

$3y = 6$, $y = 2$

$x + 2 = 5$, $x = 3$

(3, 2)

Subtract when coeff. the same

D. Solve the system using elimination.

Add when coeff. are opp.

1. $\begin{cases} 2x + 10y = 20 \\ 2x - 5y = 5 \end{cases}$

$15y = 15$, $y = 1$

$2x - 5(1) = 5$, $2x - 5 = 5$, $2x = 10$, $x = 5$

(5, 1)

2. $\begin{cases} 5x + 6y = 11 \\ 2x + 6y = 8 \end{cases}$

$3x = 3$, $x = 1$

$2(1) + 6y = 8$, $2 + 6y = 8$, $6y = 6$, $y = 1$

(1, 1)

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

$2x = 10$, $x = 5$

$3(5) + y = 13$, $15 + y = 13$, $y = -2$

(5, −2)

4. $5x - 2y = 4$
$x + 2y = 8$

$6x = 12$, $x = 2$

$2 + 2y = 8$, $2y = 6$, $y = 3$

(2, 3)

5. $5x + y = 2$
$-5x + 3y = -14$

$4y = -12$, $y = -3$

$5x - 3 = 2$, $5x = 5$, $x = 1$

(1, −3)

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

$0 = 4$

False

∅

These lines are parallel.