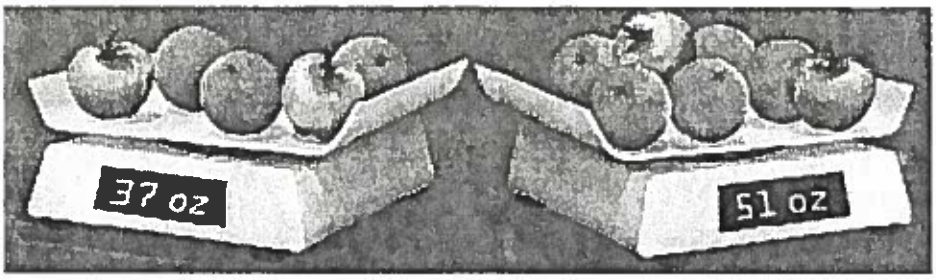
Name "Teacher" Period 1/2 Date February 12, 2018 Section 2S7

Solve Systems by Simple Elimination

A fruit stand sells fresh fruit by the weight. All apples weigh the same and all oranges weigh the same. A customer wants to know - What is the weight of 1 apple? What is the weight of 1 oranage? (Hint: Look at what is the same on each scale.)



Discuss with your group. Write down your observations and any calculations you do.

On the first scale there are 2 apples and 3 oranges. But on the second scale there are still 2 apples and 5 oranges. But on both scales there are (2 apples) just different amounts of oranges.

; both 2 apples, 3 or (or more)
; 3 oranges, 2 apples → 37 oz
; 5 oranges, 2 apples → 51 oz
14 oz

- 7 oz per oranges
- 8 oz per apples

leftover: 14 oz is 2 oranges → 14 ÷ 2 = 7 oz

7(5) = 35 oranges 51 − 35 = 16 16 ÷ 2 = 8

Key Idea:

Just like the real-world situation, we can Eliminate in algebraic systems by adding the equations together.

1) $2x + 5y = 17$
$6x - 5y = -9$

$8x + 0y = 8$

$\frac{8x}{8} = \frac{8}{8}$

$x = 1$

$2x + 5y = 17$
$2(1) + 5y = 17$
$2 + 5y = 17$
$-2 \quad -2$
$5y = 15$

$\frac{5y}{5} = \frac{15}{5}$

$y = 3$

(1, 3)

Check BOTH

$2(1) + 5(3) = 17$
$2 + 15 = 17$ ✓

$6(1) - 5(3) = -9$
$6 - 15 = -9$ ✓

Steps

1) Add the equations to eliminate one of the variables.
2) Solve for the remaining variable.
3) Substitute the variable you found back into one of the original equations.
4) Solve for the other variable.
5) Write the solution as an ordered pair.

2) $2x + 4y = 22$
$-2x + 2y = 8$

$0x + 6y = 36$
$\frac{6y}{6} = \frac{36}{6}$
$y = 6$

$2x + 4y = 22$
$2x + 4(6) = 22$
$2x + 24 = 22$
$-24 \quad -24$
$\frac{2x}{2} = \frac{-2}{2}$
$x = -1$

$(-1, 6)$

3) $-x + 5y = 13$
$x - y = 15$

$4y = 28$
$\frac{4y}{4} = \frac{28}{4}$
$y = 7$

$-x + 5y = 13$
$-x + 5(7) = 13$
$-x + 35 = 13$
$-35 \quad -35$
$\frac{-x}{-1} = \frac{-22}{-1}$
$x = 22$

$(22, 7)$

4) $x - 3y = -11$
$3x + 3y = 27$

5) Joseph goes to a store and buys 3 collared shirts and 2 ties. He spends $80 in total. His brother John buys 4 collared shirts, but he returns 2 ties for a full refund, so he only pays $60. How much does 1 collared shirt cost? How much does 1 tie cost?

x: cost of 1 collared shirts
y: cost of tie

Joseph: $3x + 2y = 80$
John: $4x - 2y = 60$

$7x + 0y = 140$
$\frac{7x}{7} = \frac{140}{7}$
$x = 20$

$3x + 2y = 80$
$3(20) + 2y = 80$
$60 + 2y = 80$
$-60 \quad -60$
$\frac{2y}{2} = \frac{20}{2}$
$y = 10$

The cost of 1 collared shirt is $20 and the cost of 1 tie is $10.