

## **Simplification and Solving Linear Systems**

Occasionally a linear system will have coefficients that are fractions or decimals. This can make solving the linear system algebraically more challenging. In these cases, it is best to simplify the linear system (making all coefficients whole numbers) prior to solving it.

### **Steps to Solve a Linear System by Elimination**

1. Multiply one (or both) of the equations by a number so each of the coefficients is a whole number.
2. Solve by substitution or comparison or elimination.

Example – Solve the linear system below.

$$0.2x + 0.6y = 0.5$$

$$0.4x - 0.3y = 0.25$$

Example – Solve the linear system below. Check your solution.

$$\frac{x}{12} + \frac{y}{3} = 1 \quad \text{and} \quad \frac{3x}{8} - \frac{y}{4} = 1$$

Example – Solve the linear system below.

$$\frac{1}{4}x - \frac{1}{9}y = 1 \quad \text{and} \quad x + y = \frac{3}{4}$$

Example – Solve the linear system below.

$$0.025x + 0.1y = 0.5$$

$$0.11x + 0.04y = -0.2$$

Homework – Please complete the questions below and questions #14ab and 20abc on page 41.

1. Solve each linear system below.

a. 
$$\begin{aligned} 0.6x - 0.3y &= 2.4 \\ -0.4x + 0.7y &= 2.9 \end{aligned}$$

b. 
$$\begin{aligned} 3x - 0.6y &= -0.9 \\ -0.5x + 0.12y &= 0.16 \end{aligned}$$

2. Solve each of the following linear systems.

a.  $\frac{x}{2} + \frac{y}{8} = 4$       and       $\frac{x}{3} - \frac{y}{2} = -2$

b.  $\frac{m}{3} + \frac{n}{2} = 3$     and     $\frac{2m}{3} - \frac{3n}{4} = -1$