Today we will finalize our discussion of when it is easiest to use substitution, and when it is easiest to use elimination, when solving systems of linear equations.

Substitution is best used when at least one of the equations already has a variable isolated. Below are examples of some such systems:

$$\begin{cases} y = 3x \\ y = 2x - 11 \end{cases} \quad \text{and} \quad \begin{cases} x = 2y + 4 \\ 2x - 4y = 13 \end{cases}.$$

Elimination is best used in other situations, such as when both of the equations are in standard form. Below are examples of some such systems:

$$\begin{cases} 5x + 7y = 10 \\ 2x - 4y = 17 \end{cases} \quad \text{and} \quad \begin{cases} x - 2y = 4 \\ 2x - 4y = 13 \end{cases}.$$

Let's try these two exercises together. Solve each system of linear equations using either substitution or elimination.

- $\begin{cases} x = -3y + 11 \\ 2x - y = 1 \end{cases}$
- $\begin{cases} 2x - y = 6 \\ 3x + y = 4 \end{cases}$

Now its your turn to try a few exercises on your own. Locate the point of intersection for each pair of lines, using either substitution or elimination. Remember to write each answer as an ordered pair (i.e. (x, y)).

1. $\begin{cases} y = 4x + 6 \\ y = -2x \end{cases}$

2. $\begin{cases} 5x - 3y = 16 \\ 4x + 5y = -2 \end{cases}$

3. $\begin{cases} \frac{2}{3}x - \frac{1}{2}y = \frac{43}{54} \\ 2x - \frac{4}{5}y = \frac{76}{45} \end{cases}$

4. $\begin{cases} y = -4x + 30 \\ -\frac{3}{4}x + 2y = -\frac{55}{2} \end{cases}$