

Solving Systems of equations

Numerical Problems

1.
$$\begin{cases} x - 2y = 8 \\ 3x + y = 3 \end{cases}$$

- How to solve by graphing
 - i. Change to $y=mx+b$ form
 - ii. Graph the y-intercept
 - iii. Find the next points using the slope
 - iv. Repeat for other lines

2.
$$\begin{cases} 3x - 2y = 20 \\ 5x + y = 42 \end{cases}$$

- How to solve by substitution
 - i. Isolate one of the variables (one with the lowest co-efficient usually works best)
 - ii. Divide both sides by the co-efficient of the isolated variable
 - iii. Substitute that value into the same variable in the other equation
 - iv. Find the value of the other variable and then write (x,y)

3.
$$\begin{cases} 4x + 5y = 31 \\ 6x + 7y = 45 \end{cases}$$

- How to solve by elimination
 - i. Multiply both equations by their factor in the lowest common variable
 - ii. Add or subtract one from the other so you eliminate the equal variables
 - iii. Calculate the value of the remaining variable
 - iv. Substitute the value of that variable to find the value of the other
 - v. Write as (x,y)

Word problems

4. There are ninety coins, consisting of quarters and loonies, total \$42, how many of each type of coin are there?

- Begin with the "let... then..." statement
- In this case, let x represent the number of quarters, and y represents the number of loonies. Then,
$$\begin{cases} x + y = 90 \\ 25x + 100y = 4200 \end{cases}$$
- Then simplify both equations, in this case, only the second can be simplified
$$\begin{cases} x + y = 90 \\ x + 4y = 168 \end{cases}$$
- Then you solve the system of equation, by whatever means easiest (or required)