

Elimination

SE3

Uses the method of adding or subtracting to eliminate one of the variables

You may need to rewrite one of the equations first before using elimination (by multiplying up to get equal or opposite coefficients)

- 1) Write the system so like terms are aligned (standard form)
- 2) Eliminate one of the variables (using addition or subtraction)
- 3) Solve for the variable that is left over
- 4) Use substitution (in an original equation) to solve for the other variable
- 5) Write the answers as an ordered pair and check by substitution in BOTH equations

Example: $3x + 4y = 7$
 $+ 2x - 4y = 13$

$$\begin{array}{r} 3x + 4y = 7 \\ + 2x - 4y = 13 \\ \hline 5x = 20 \\ \boxed{x = 4} \end{array}$$

$$\boxed{(4, -\frac{5}{4})}$$

$$12 - 5 = 7 \checkmark$$

$$8 + 5 = 13 \checkmark$$

$$3(4) + 4y = 7$$

$$12 + 4y = 7$$

$$4y = -5$$

$$\boxed{y = -\frac{5}{4}}$$

Example: $7x - 4y = 100$ [A]
 $2(3x - 2y = 40)$ [B]

if you just add or subtract the equations, nothing will be eliminated, so you have to alter one of the equations first

$$\begin{array}{r} 7x - 4y = 100 \\ - 6x - 4y = 80 \\ \hline \boxed{x = 20} \end{array}$$

$$140 - 40 \checkmark$$

$$60 - 20 \checkmark$$

$$\boxed{(20, 10)}$$

$$7(20) - 4y = 100$$

$$140 - 4y = 100$$

$$-4y = -40$$

$$\frac{-4y}{-4} = \frac{-40}{-4}$$

$$\boxed{y = 10}$$