

4.4 Solving Systems by Elimination

Wednesday, June 19, 2019 10:45 AM

$$\begin{array}{r}
 -6x + 5y = 21 \\
 + \quad x - 5y = -1 \\
 \hline
 -5x = 20 \\
 \frac{-5x}{-5} = \frac{20}{-5} \\
 \boxed{x = -4}
 \end{array}$$

cancel
y-variables eliminated

$$\begin{array}{r}
 -6(-4) + 5y = 21 \\
 +4 \quad +4 \\
 -5y = 3 \\
 \frac{-5y}{-5} = \frac{3}{-5} \\
 \boxed{y = -3/5}
 \end{array}$$

$$\begin{array}{r}
 24 + 5y = 21 \\
 -24 \quad -24 \\
 5y = -3 \\
 \frac{5y}{5} = \frac{-3}{5} \\
 \boxed{y = -3/5}
 \end{array}$$

$$\begin{array}{r}
 2(2x + 3y = -8) \\
 -4x + y = 2 \\
 + \quad 4x + 6y = -16 \\
 \hline
 7y = -14 \\
 \frac{7y}{7} = \frac{-14}{7} \\
 \boxed{y = -2}
 \end{array}$$

Cancel

$$\begin{array}{r}
 -4x + (-2) = 2 \\
 +2 \quad +2 \\
 -4x = 4 \\
 \frac{-4x}{-4} = \frac{4}{-4} \\
 \boxed{x = -1}
 \end{array}$$

- ① Check x's, y's, #'s are aligned
- ② Add equations together
*Goal: x's or y's cancel

- Yes Cancel
- ③ Solve for remaining variable
 - ④ Plug in solution to find other variable

- No Cancel
- ③ Identify which variable (x or y) would be easy to cancel
 - ④ Multiple one or both equations by a value so that the x's or y's will be opposites (and thus will cancel with each other)

3 Types of Solution Sets:

One Solution



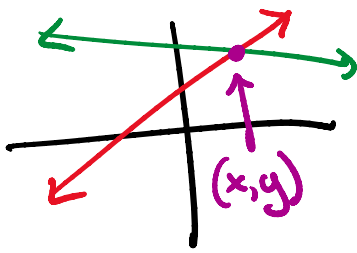
No Solutions



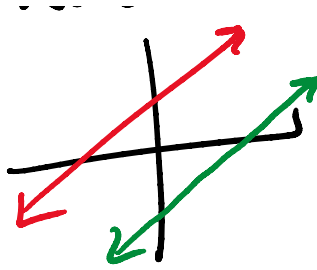
Infinite Solutions



One solution

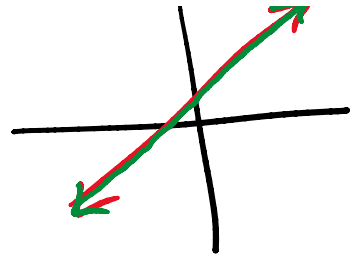


$$x = -1 \quad y = -2$$



$$4 = 10$$

FALSE



$$3 = 3$$

TRUE