

SYSTEMS OF EQUATIONS

System: 2 or More Equations

TYPES OF SOLUTIONS

1. One Solution
2. Infinite
3. No Solution

SYSTEMS OF EQUATIONS: ELIMINATION

STEPS

1. Make Something Cancel
2. Solve for 1st Variable
3. Substitute & Solve for 2nd Variable

EXAMPLE #1

$$2 \begin{pmatrix} 2x + 2y = 5 \\ 4x - 4y = 10 \end{pmatrix}$$

$$\begin{array}{r} 4x + 4y = 10 \\ + 4x - 4y = 10 \\ \hline \end{array}$$

$$\frac{8x}{8} = \frac{20}{8}$$

$$x = \frac{5}{2}$$

$$\begin{array}{l} 2x + 2y = 5 \\ 2\left(\frac{5}{2}\right) + 2y = 5 \\ 5 + 2y = 5 \\ 2y = 0 \end{array}$$

$$\begin{array}{l} x = \frac{5}{2} \\ y = 0 \end{array}$$

EXAMPLE #2

$$\begin{array}{l} x + 10y = 3 \\ 4x + 5y = 5 \end{array}$$

$$x + 10y = 3$$

$$\begin{array}{r} 8x + 10y = 10 \\ \hline \end{array}$$

$$\begin{array}{r} -7x = -7 \\ \hline -7 \end{array}$$

$$\begin{array}{r} x + 10y = 3 \\ 1 + 10y = 3 \\ -1 \quad -1 \\ \hline 10y = 4 \end{array}$$

$$\begin{array}{l} x = 1 \\ y = 2/5 \end{array}$$

EXAMPLE #3

$$\begin{cases} 5(3x - 2y = -7) \\ 2(2x - 5y = 10) \end{cases}$$

$$\begin{array}{r} 15x - 10y = -35 \\ - \quad 4x - 10y = 20 \\ \hline \end{array}$$

$$\frac{11x = -55}{11} \quad \frac{11}{11}$$

$$\begin{array}{l} 3(-5) - 2y = -7 \\ -15 - 2y = -7 \\ \underline{-2y = 8} \\ \underline{-2} \quad \underline{-2} \end{array}$$

$$\begin{array}{l} x = -5 \\ y = -4 \end{array}$$