

11/26/12 Systems of Equations, Addition Method

Solve Using the Addition Method

Example

$$\begin{cases} (2w + 3z = 17)(3) \\ (3w + 4z = 24)(-2) \end{cases}$$

Same #, opposite sign!

$$\begin{cases} 6w + 9z = 51 \\ -6w - 8z = -48 \\ \hline z = 3 \end{cases}$$

plug into either equ.

$$2w + 3(3) = 17$$

$$2w + 9 = 17$$

$$\quad -9 \quad -9$$

$$\frac{2w}{2} = \frac{8}{2}$$

$$w = 4 \quad \text{Ans: } \boxed{(4, 3)}$$

Example

$$\begin{cases} (3x - 2y = 10)(3) \\ (5x + 3y = 4)(2) \end{cases}$$

Same # opp. sign!

$$\begin{cases} 9x - 6y = 30 \\ 10x + 6y = 8 \\ \hline 19x = 38 \\ \frac{19x}{19} = \frac{38}{19} \\ x = 2 \end{cases}$$

plug into either equ.

$$3(2) - 2y = 10$$

$$6 - 2y = 10$$

$$\quad -6 \quad -6$$

$$\frac{-2y}{-2} = \frac{4}{-2}$$

$$y = -2 \quad \text{Ans: } \boxed{(2, -2)}$$

Example

$$\begin{cases} x - 3y = 0 \\ 5x - y + 14 = 0 \end{cases}$$

If the #s and variables aren't lined up, line them up!

$$\begin{cases} (x - 3y = 0)(-5) \\ (5x - y = -14)(1) \end{cases}$$

$$\begin{cases} -5x + 15y = 0 \\ 5x - y = -14 \\ \hline 14y = -14 \\ \frac{14y}{14} = \frac{-14}{14} \\ y = -1 \end{cases}$$

$$x - 3(-1) = 0$$

$$x + 3 = 0$$

$$\quad -3 \quad -3$$

$$x = -3$$

$$\text{Ans: } \boxed{(-3, -1)}$$

Example

$$\begin{cases} (2a + 3b = -1)(3) \\ (3a + 5b = -2)(-2) \end{cases}$$

$$\begin{cases} 6a + 9b = -3 \\ -6a - 10b = 4 \\ \hline -1b = 1 \\ \frac{-1b}{-1} = \frac{1}{-1} \\ b = -1 \end{cases}$$

$$2a + 3(-1) = -1$$

$$2a - 3 = -1$$

$$\quad +3 \quad +3$$

$$\frac{2a}{2} = \frac{2}{2}$$

$$a = 1$$

$$\text{Ans: } \boxed{(1, -1)}$$