

## 3.2b Elimination

Goal: Eliminate  $x$  or  $y$  by adding the 2 equations together.

Solve

$$\begin{array}{l} \textcircled{1} (3x + 3y = -15) \times 3 \longrightarrow \\ \textcircled{2} 5x - 9y = 3 \longrightarrow \end{array}$$

← Multiply  
by 3

$$\begin{array}{r} 9x + 9y = -45 \\ + 5x - 9y = 3 \\ \hline \end{array} \left. \begin{array}{l} \\ \\ \end{array} \right\} \begin{array}{l} \text{Now the} \\ y\text{'s will} \\ \text{cancel} \end{array}$$

$$\frac{14x}{14} = \frac{-42}{14}$$

$$x = -3$$

Now plug  $x = -3$  into eqn  $\textcircled{1}$  or  $\textcircled{2}$

$$3(-3) + 3y = -15$$

$$\begin{array}{r} -9 \\ +9 \end{array} + 3y = \begin{array}{r} -15 \\ +9 \end{array}$$

$$\begin{array}{l} 3y = -6 \\ y = -2 \end{array}$$

$$\boxed{(-3, -2)}$$

Solve

$$\begin{aligned} \textcircled{1} & (4x + 3y = -2) * 5 \\ \textcircled{2} & (x + 5y = -9) * -3 \end{aligned}$$


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$$\begin{aligned} 20x + 15y &= -10 \\ -3x - 15y &= 27 \end{aligned}$$


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$$\frac{17x}{17} = \frac{17}{17}$$

$$x = 1$$

plug in  $\textcircled{1}$  or  $\textcircled{2}$

$$4(1) + 3y = -2$$

$$4 + 3y = -2$$

$$3y = -6$$

$$y = -2$$

$(1, -2)$



## P164: Elimination

$$\begin{array}{l} 15) \quad 2x + 6y = 17 \\ \quad \quad 2x - 10y = 9 \end{array}$$

$$\begin{array}{l} 17) \quad 3x - 4y = -10 \\ \quad \quad 6x + 3y = -42 \end{array}$$

$$\begin{array}{l} 21) \quad 2x + 5y = 14 \\ \quad \quad 3x - 2y = -36 \end{array}$$

$$\begin{array}{l} *23) \quad 3x + 4y = 18 \\ \quad \quad 6x + 8y = 18 \end{array}$$

$$\begin{array}{l} 25) \quad 4x - 5y = 13 \\ \quad \quad 6x + 2y = 48 \end{array}$$

$$\begin{array}{l} *18) \quad 4x - 3y = 10 \\ \quad \quad 8x - 6y = 20 \end{array}$$