

3.2/3.3 Solving Systems of Equations

Ex. 1

Substitution Method

$$\begin{aligned}
 2x + 3y &= 5 \\
 x - 5y &= 9 \quad x = 5y + 9 \quad (4, -1) \\
 2(5y + 9) + 3y &= 5 \\
 13y + 18 &= 5 \\
 &\vdots \\
 &\vdots \\
 y &= -1 \quad x = 4
 \end{aligned}$$

Ex. 2 Linear Combination Method

$$\begin{aligned}
 2(5x + 3y &= -9) \\
 -5(2x - 5y &= -16) \\
 \hline
 31y &= 62 \\
 (-3, 2) \quad y &= 2 \\
 &\quad x = -3
 \end{aligned}$$

$$\begin{aligned}
 3\left(\frac{1}{x} - \frac{1}{y} = 5\right) & \quad 2\left(\frac{3}{2} - \frac{1}{y} = 5\right) \\
 \left(\frac{5}{x} + \frac{3}{y} = -3\right) & \quad 3y - 2 = 10y \\
 \hline
 \frac{3}{x} - \frac{3}{y} &= 15 \quad y = -\frac{2}{7} \\
 \frac{5}{x} + \frac{3}{y} &= -3 \quad (2/3, -2/7) \\
 \hline
 \frac{8}{x} &= 12 \\
 \frac{8}{12} &= \frac{x}{1} \\
 x &= \frac{2}{3}
 \end{aligned}$$