Notes 7.3 Solving Systems Using Substitution (for slope-intercept systems)

1. $\begin{cases} y = x - 12 \\ y = -3x + 28 \end{cases}$

$x - 12 = -3x + 28$

$+3x \quad +3x$

$4x - 12 = 28$

$+12 \quad +12$

$4x = 40$

$\frac{4x}{4} = \frac{40}{4}$

$x = 10$

solution: $(10, -2)$

check: $\begin{cases} -2 = 10 - 12 \\ -2 = -3(10) + 28 \end{cases}$

2. $\begin{cases} y = x - 9 \\ -x + 10y = 18 \end{cases}$

$-x + 10(x - 9) = 18$

$-x + 10x - 90 = 18$

$9x - 90 = 18$

$+90 \quad +90$

$9x = 108$

$\frac{9x}{9} = \frac{108}{9}$

$x = 12$

solution: $(12, \quad)$

check: $\begin{cases} 3 = 12 - 9 \\ -12 + 10(3) = 18 \end{cases}$

Notes 7.4 Solving Systems Using Linear Combination (for standard form systems)

1. $\begin{cases} 3x - 2y = 9 \\ -3x + y = -12 \end{cases}$

$+$

$-y = -3$

$\frac{-y}{-1} = \frac{-3}{-1}$

$y = 3$

solution: $(5, 3)$

check: $\begin{cases} 3(5) - 2(3) = 9 \\ -3(5) + 3 = -12 \end{cases}$

2. $\begin{cases} 2x - 3y = -2 \\ 7x - 6y = -7 \end{cases}$

$+\begin{cases} -4x + 6y = 4 \\ 7x - 6y = -7 \end{cases}$

$3x = -3$

$\frac{3x}{3} = \frac{-3}{3}$

$x = -1$

solution: $(-1, 0)$

check: $\begin{cases} 2(-1) - 3(0) = -2 \\ 7(-1) - 6(0) = -7 \end{cases}$

3. $3\begin{cases} 4x + 2y = 14 \\ 2\begin{cases} 5x - 3y = -10 \end{cases} \end{cases}$

$\begin{cases} 12x + 6y = 42 \\ 10x - 6y = -30 \end{cases}$

$22x = 22$

$\frac{22x}{22} = \frac{22}{22}$

$x = 1$

solution: $(1, 5)$

check: $\begin{cases} 4(1) + 2(5) = 14 \\ 5(1) - 3(5) = -10 \end{cases}$

4. $2\begin{cases} 8x + 3y = 4 \\ -3\begin{cases} 3x + 2y = -2 \end{cases} \end{cases}$

$\begin{cases} 16x + 6y = 8 \\ -9x - 6y = 6 \end{cases}$

$7x = 14$

$\frac{7x}{7} = \frac{14}{7}$

$x = 2$

solution: $(2, -4)$

check: $\begin{cases} 8(2) + 3(-4) = 4 \\ 3(2) + 2(-4) = -2 \end{cases}$