

Solve the following using **SUBSTITUTION**. You **MUST** show your work to receive credit.

1.  $y = -5$

$5x + 4y = -20$

$5x + 4(-5) = -20$

$5x - 20 = -20$

$+20 \quad +20$

$5x = 0$

$x = 0$

$(0, -5)$

2.  $4x + 2y = 10$

$x - y = 13 \rightarrow x = y + 13$

$y = -7$

$4(y + 13) + 2y = 10$

$4y + 52 + 2y = 10$

$6y + 52 = 10$

$6y = -42$

$4x + 2(-7) = 10$

$4x - 14 = 10$

$+14 \quad +14$

$4x = 24$

$x = 6$

$(6, -7)$

3.  $y = 4x - 9$

$y = x - 3$

$4x - 9 = x - 3$

$-x \quad -x$

$3x - 9 = -3$

$+9 \quad +9$

$3x = 6$

$x = 2$

$y = 2 - 3$

$y = -1$

$(2, -1)$

Solve the following using **ELIMINATION**. You **MUST** show your work to receive credit.

4.  $(8x - 6y = -20) \cdot 2 \rightarrow 16x - 12y = -40$

$-16x + 7y = 30$

$16x - 12y = -40$

$-16x + 7y = 30$

$-5y = -10$

$y = 2$

$8x - 6(2) = -20$

$(-1, 2)$

$8x - 12 = -20$

$+12 \quad +12$

$8x = -8$

$x = -1$

5.  $-4y - 11x = 36 \rightarrow (36 = -11x - 4y) \cdot 10 \rightarrow -360 = 110x + 40y$

$(20 = -10x - 10y) \cdot 4 \rightarrow 80 = -40x - 40y$

$-360 = 110x + 40y$

$80 = -40x - 40y$

$-280 = 70x$

$x = -4$

$-4y - 11(-4) = 36$

$(-4, 2)$

$-4y + 44 = 36$

$-4y - 44$

$-4y = -8$

$y = 2$

6.  $6x - 12y = 24$

$-x - 6y = 4 \quad \cdot 2 \rightarrow 2x + 12y = -8$

$$\begin{array}{r} 6x - 12y = 24 \\ + 2x + 12y = -8 \\ \hline 8x = 16 \\ x = 2 \end{array}$$

$$\begin{array}{r} 6(2) - 12y = 24 \\ 12 - 12y = 24 \\ -12 \quad -12 \\ \hline -12y = 12 \\ y = -1 \end{array}$$

$(2, -1)$

Solve the following using ANY METHOD. You MUST show your work to receive credit.

7.  $6x - 2y = -6 \quad \cdot 2 \rightarrow 12x - 4y = -12$   
 $7x + 4y = 8$

$$\begin{array}{r} 12x - 4y = -12 \\ 7x + 4y = 8 \\ \hline 19x = -4 \\ x = -4.75 \end{array}$$

$$\begin{array}{r} 6(-4.75) - 2y = -6 \\ -28.5 - 2y = -6 \\ +28.5 \quad +28.5 \\ \hline -2y = 22.5 \\ y = 11.25 \end{array}$$

$(-4.75, 11.25)$

8.  $-6x - 9y = 0 \rightarrow (-6x = 9y) \cdot 4 \rightarrow 24x = -36y$   
 $-24x = 36y$

$$\begin{array}{r} 24x = -36y \\ -24x = 36y \\ \hline 0 = 0 \end{array}$$

9. infinite solutions  
 $x + 8y = -15 \quad \cdot (-1) \rightarrow -x - 8y = 15$   
 $7x + 8y = -9$

$$\begin{array}{r} -x - 8y = 15 \\ 7x + 8y = -9 \\ \hline 6x = 6 \\ x = 1 \end{array}$$

$$\begin{array}{r} 1 + 8y = -15 \\ -1 \quad -1 \\ \hline 8y = -16 \\ y = -2 \end{array}$$

$(1, -2)$

10.  $-9x - 3y = -2$

$y = -3x - 4$

$$\begin{array}{r} -9x - 3(-3x - 4) = -2 \\ -9x + 9x + 12 = -2 \\ 12 \neq -2 \end{array}$$

no solution

Bonus: Make the number 7 using four 4's