Written

Example 1: Solve for x and y: $\begin{cases} 3x - 2y = 5 \\ 4x + 5y = -1 \end{cases}$

Addition and Subtraction Method. Multiply both equations to make the coefficients of x (or y if it is easier) the same, then add or subtract the two equations to eliminate that variable. In this case we multiply the first equation by 5 and the second by 2, then add to eliminate y.

$$\begin{array}{r} 15x - 10y = 25 \\ 8x + 10y = -2 \\ \hline 23x \quad\quad = 23 \\ x = 1 \end{array}$$

Substitute in either equation to find y.

$$\begin{aligned} 3 \cdot 1 - 2y &= 5 \\ -2y &= 2 \\ y &= -1 \end{aligned}$$

Ans. $(1, -1)$

Example 2: Solve for x and y: $\begin{cases} 2x - 3y = 0 & (1) \\ x + y = 5 & (2) \end{cases}$

Substitution Method. If it easy to do so, solve one equation for x or y, (whichever is easier) and substitute into the other equation.

$$\begin{aligned} (2) \quad & y = 5 - x \\ (1) \quad & 2x - 3(5 - x) = 0 \\ & 2x - 15 + 3x = 0 \\ & 5x = 15 \\ & x = 3 \end{aligned}$$

Substitute in either equation to find y.

$$\begin{aligned} 2 \cdot 3 - 3y &= 0 \\ -3y &= -6 \\ y &= 2 \end{aligned}$$

Ans. $(3, 2)$

Solve for x and y by the easiest method.

1. $\begin{cases} x + 3y = 6 \\ 2x - y = 5 \end{cases}$
2. $\begin{cases} 5x - 3y = 14 \\ 2x - y = 6 \end{cases}$
3. $\begin{cases} -x + 4y = 7 \\ 3x - 2y = 9 \end{cases}$
4. $\begin{cases} 2x - 7y = -11 \\ -5x + 3y = 13 \end{cases}$
5. $\begin{cases} -6x - 7y = -3 \\ 4x - 3y = 25 \end{cases}$
6. $\begin{cases} 7x - 3y = 1 \\ x + 4y = 9 \end{cases}$
7. $\begin{cases} 12x - 6y = -2 \\ -9x - 7y = -10 \end{cases}$
8. $\begin{cases} -6x + 10y = 3 \\ 18x - 10y = 1 \end{cases}$
9. $\begin{cases} 8x = 3y \\ 5x - 2y = -1 \end{cases}$

APC