

Sometimes, we must Multiply one or both of the equations by a constant, in order to get two coefficients that are same <sup>but</sup> opposite.

Ex 5)  $\begin{cases} 3x + 6y = 6 \\ -3(2x - 3y = 4) \end{cases}$

$$\begin{array}{r} \cancel{6}x + 12y = 12 \\ + \quad \cancel{-6}x + 9y = -12 \\ \hline \end{array}$$

$$\begin{array}{r} \frac{21y}{21} = \frac{0}{21} \\ \hline y = 0 \end{array} \quad \begin{array}{r} 2x - 3y = 4 \\ 2x - 3(0) = 4 \\ \hline 2x = 4 \\ x = 2 \end{array}$$

$(2, 0)$        $x = 2$

Ex 6)  $\begin{cases} 8x - 9y = 19 \\ 9(4x + y = -7) \end{cases}$

$$\begin{array}{r} 8x - 9y = 19 \\ + \quad 36x + 9y = -63 \\ \hline 44x = -44 \\ \hline x = -1 \end{array} \quad \begin{array}{r} 4x + y = -7 \\ 4(-1) + y = -7 \\ -4 + y = -7 \\ +4 \quad +4 \\ \hline y = -3 \end{array}$$

$x = -1$        $(-1, -3)$        $y = -3$

Ex 7)  $\begin{cases} 4x - 3y - 11 = 0 \\ 3x - 5y = -11 \end{cases}$

$$\begin{array}{r} -5(4x - 3y = 11) \\ 3(3x - 5y = -11) \\ \hline -20x + 15y = -55 \\ + \quad 9x - 15y = -33 \\ \hline -11x = -88 \\ \hline x = 8 \end{array}$$

$$\begin{array}{r} 3(8) - 5y = -11 \\ 24 - 5y = -11 \\ -24 \quad -24 \\ \hline -5y = -35 \\ \hline y = 7 \end{array}$$

$x = 8$        $y = 7$

$(8, 7)$

Ex 8)  $\begin{cases} 5x + 7y = -1 \\ -22 + 4x = 2y \end{cases}$

$$\begin{array}{r} 4(5x + 7y = -1) \\ -5(4x - 2y = 22) \\ \hline 20x + 28y = -4 \\ -20x + 10y = -110 \\ \hline 38y = -114 \\ \hline y = -3 \end{array}$$

$(4, -3)$

Ex 9)  $\begin{cases} 5(x - y) = 5 \\ 3(x - y) = 4 \end{cases}$

$$\begin{array}{r} 5(x - y) = 5 \\ -3(x - y) = 4 \\ \hline 5x - 5y = 5 \\ -3x + 3y = 4 \\ \hline 2x - 2y = 1 \end{array}$$

$0 = 1$   
parallel lines  
no solutions

Ex 10)  $\begin{cases} 5(x + y) = 7 \\ -5x - 5y = -35 \end{cases}$

$0 = 0$   
same line  
infinite solutions