

Solve the following systems of equations.

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

2.  $(x, y) = \left(-\frac{24}{7}, \frac{39}{7}\right)$

3.  $(x, y) = \left(\frac{3}{2}, \frac{12}{5}\right)$

4.

$$6x - 4y + 1 = 9x - 8y + 2 = 4y - 3x$$

$$-3x + 4y - 1 = 0 = -12x + 12y - 2$$

Now we solve we have two equations equal to 0 so we solve the following system:

$$\begin{cases} -3x + 4y - 1 = 0 \\ -12x + 12y - 2 = 0 \end{cases} \quad (x, y) = \left(\frac{1}{3}, \frac{1}{2}\right)$$

5.  $(x, y) = \left(\frac{7}{9}, \frac{25}{9}\right)$

6.  $(x, y) = \left(1, \frac{1}{2}\right)$

7.  $(x, y) = (5, -4)$

8.  $(x, y) = \left(-\frac{8}{5}, \frac{41}{5}\right)$

9. Using the substitution  $u = \frac{1}{x}$  and  $v = \frac{1}{y}$ , we get the following system:

$$\begin{cases} u + 2v = -1 \\ 3u + 5v = 2 \end{cases} \quad \text{Our solution to this system is } (u, v) = (9, -5) \text{ so } (x, y) = \left(\frac{1}{9}, -\frac{1}{5}\right)$$

10. Using the substitution  $u = \frac{1}{x}$  and  $v = \frac{1}{y}$ , we get the following system:

$$\begin{cases} \frac{u}{3} + \frac{4v}{5} = 0 \\ \frac{u}{2} - \frac{2v}{15} = \frac{10}{3} \end{cases} \quad \text{Our solution to this system is } (u, v) = \left(6, -\frac{5}{2}\right) \text{ so } (x, y) = \left(\frac{1}{6}, -\frac{2}{5}\right)$$