

DAY 4 - Elimination Method

Solve the systems and check the solutions.

A. $x + 4y - 5 = 0$

$x + 2y = 7$

$$\begin{array}{r} x + 4y = 5 \\ x + 2y = 7 \\ \hline -2y = -2 \\ y = 1 \end{array}$$

$1x + 4y = 5$

$-1x - 2y = -7$

$$\begin{array}{r} 1x + 4y = 5 \\ -1x - 2y = -7 \\ \hline 6y = -2 \\ y = -\frac{1}{3} \end{array}$$

$$\begin{array}{r} x + 4y = 5 \\ x + 2y = 7 \\ \hline -2y = -2 \\ y = 1 \end{array}$$

$1x + 4y = 5$

$-2x - 4y = -14$

$$\begin{array}{r} 1x + 4y = 5 \\ -2x - 4y = -14 \\ \hline -1x = -9 \\ x = 9 \end{array}$$

$-1x = -9$

$x = 9$

POI (9, -1) check in ①

$$\begin{array}{r} x + 4y - 5 = 0 \\ 9 + 4(-1) - 5 = 0 \\ 9 - 4 - 5 = 0 \\ 0 = 0 \end{array}$$

8x3

24

B. $x - 3y + 2 = 0$

$5y + 2x = 7$

$$\begin{array}{r} x - 3y = -2 \\ 2x + 5y = 7 \\ \hline -2x - 3y = -4 \\ 2x + 5y = 7 \\ \hline 2y = 3 \\ y = \frac{3}{2} \end{array}$$

$-2x + 6y = 4$

$2x + 5y = 7$

$8x + 11y = 11$

$11y = 11$

$y = 1$

$$\begin{array}{r} 2x - 3y = -2 \\ 2x + 5y = 7 \\ \hline -8y = -9 \\ y = \frac{9}{8} \end{array}$$

$5x - 15y = -10$

$6x + 15y = 21$

$11x + 0y = 11$

$11x = 11$

$x = 1$

POI (1, 1)

check in ②

$$\begin{array}{r} 5y + 2x = 7 \\ 5(1) + 2(1) = 7 \\ 5 + 2 = 7 \\ 7 = 7 \end{array}$$

C. $2x + y = 3$

$-3y + 4x = 1$

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

$-4x - 2y = -6$

$4x - 3y = 1$

$8x - 5y = -5$

$-5y = -5$

$y = 1$

$2x + y = 3$

$4x - 3y = 1$

$6x + 3y = 9$

$4x - 3y = 1$

$10x + 0y = 10$

$10x = 10$

$x = 1$

POI (1, 1)

check in ①

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

Solve the systems and check the solutions.

$2x + 3y + 1 = 0$

D. $y + x = 1$

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

$$\begin{array}{r} 2x + 3y = -1 \\ -2x - 2y = -2 \\ \hline 0x + 5y = 1 \end{array}$$

$$0x + 5y = 1 \quad (y = \frac{1}{5})$$

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

$$\begin{array}{r} 2x + 3y = -1 \\ -3x - 3y = -3 \\ \hline -x + 0y = -4 \\ -1x = -4 \\ x = 4 \end{array}$$

∴ POI (4, -3)

check in (2) $y + x = 1$
 $-3 + 4 = 1$ ✓

$6x + 5y = 7$

E. $x - 3 = y$

$$\begin{array}{r} 6x + 5y = 7 \\ x - y = 3 \\ \hline 6x + 5y = 7 \\ -x + y = 3 \\ \hline 5x + 4y = 4 \end{array}$$

$$\begin{array}{r} 6x + 5y = 7 \\ -6x + 6y = -18 \\ \hline 0x + 11y = -11 \end{array}$$

$$0x + 11y = -11 \quad (y = -1)$$

$$\begin{array}{r} 6x + 5y = 7 \\ x - y = 3 \\ \hline 6x + 5y = 7 \\ -x - y = 3 \\ \hline 5x + 6y = 4 \end{array}$$

$$\begin{array}{r} 6x + 5y = 7 \\ 5x - 5y = 15 \\ \hline 11x + 0y = 22 \\ 11x = 22 \\ x = 2 \end{array}$$

∴ POI (2, -1)

check (1) $6x + 5y = 7$
 $6(2) + 5(-1) = 7$
 $12 - 5 = 7$ ✓

$x - 3y = 5$

F. $2y + 7x = 12$

$$\begin{array}{r} x - 3y = 5 \\ 7x + 2y = 12 \\ \hline x - 3y = 5 \\ -7x - 2y = -12 \\ \hline -2y = -7 \\ y = \frac{7}{2} \end{array}$$

$$\begin{array}{r} -7x + 21y = -35 \\ 7x + 2y = 12 \\ \hline 0x + 23y = -23 \end{array}$$

$$0x + 23y = -23 \quad (y = -1)$$

$$\begin{array}{r} x - 3y = 5 \\ 7x + 2y = 12 \\ \hline x - 3y = 5 \\ -7x - 2y = -12 \\ \hline -2y = -7 \\ y = \frac{7}{2} \end{array}$$

$$\begin{array}{r} 2x - 6y = 10 \\ 21x + 6y = 36 \\ \hline 23x = 46 \\ x = 2 \end{array}$$

∴ POI (2, 1)

check in (1) $x - 3y = 5$
 $2 - 3(1) = 5$
 $2 - 3 = -1 \neq 5$ ✓