

Linear Systems: Solving by Elimination Continued...

Date Solutions

PRACTICE QUESTIONS: Solve the following systems using Elimination ...

a) $x + 2y = 11$ (1)
 $-3x + y = -5$ (2) $\times 2$

$$\begin{array}{r} x + 2y = 11 \\ -6x + 2y = -10 \\ \hline 7x + 0 = 21 \\ 7x = 21 \\ \frac{7}{7} \quad \frac{7}{7} \\ \hline x = 3 \end{array}$$

SUBTRACT

Sub. $x=3$ into (1)
 $(3) + 2y = 11$
 $3 + 2y = 11$
 $2y = 11 - 3$
 $2y = 8$
 $\frac{2y}{2} = \frac{8}{2}$
 $y = 4$

POI is (3,4)

b) $3x + 2y = 6$ (1)
 $-x + y = -2$ (2) $\times 3$

$$\begin{array}{r} 3x + 2y = 6 \\ -3x + 3y = -6 \\ \hline 0 + 5y = 0 \\ 5y = 0 \\ \frac{5y}{5} = \frac{0}{5} \\ \hline y = 0 \end{array}$$

ADD

Sub. $y=0$ into (2)
 $-x + (0) = -2$
 $-x = -2$
 $\frac{-x}{-1} = \frac{-2}{-1}$
 $x = 2$

POI is (2,0)

Rearrange equations so the x's, y's and equal signs line up!

c) $2x + y = 25$ (1)
 $3y = 2x - 13$ (2)

$$\begin{array}{r} 2x + y = 25 \\ -2x + 3y = -13 \\ \hline 0 + 4y = 12 \\ 4y = 12 \\ \frac{4y}{4} = \frac{12}{4} \\ \hline y = 3 \end{array}$$

ADD

Sub. $y=3$ into (1)
 $2x + (3) = 25$
 $2x = 25 - 3$
 $2x = 22$
 $\frac{2x}{2} = \frac{22}{2}$
 $x = 11$

∴ POI is (11,3)

Rearrange equations so the x's, y's and equal signs line up!

d) $-3x + 4y = -18$ (1)
 $x = -2y - 4$ (2)

$$\begin{array}{r} -3x + 4y = -18 \\ x + 2y = -4 \quad \times 2 \Rightarrow 2x + 4y = -8 \\ \hline -5x + 0 = -10 \\ -5x = -10 \\ \frac{-5x}{-5} = \frac{-10}{-5} \\ \hline x = 2 \end{array}$$

SUBTRACT

Sub. $x=2$ into (2)
 $2 = -2y - 4$
 $2y = -4 - 2$
 $2y = -6$
 $\frac{2y}{2} = \frac{-6}{2}$
 $y = -3$

POI is (2,-3)