

Unit PRACTICE/REVIEW: Linear Systems PART 1

1) In the realm of linear systems, what do each of these mean? (3K)

a) No Solution

the lines would be parallel.

b) Infinite Solutions

the lines are the same

c) Point of Intersection

the lines cross at a specific point.

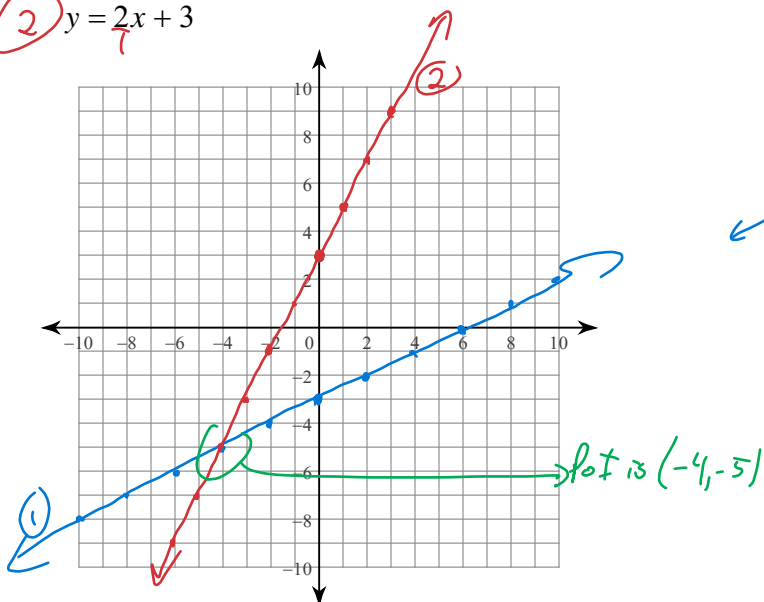
Determine if the given point of intersection is indeed the point of intersection. (3T)

2) The POI is $(3, 0)$
 $-54 + 18x + 8y = 0$
 $5y = 6x - 18$

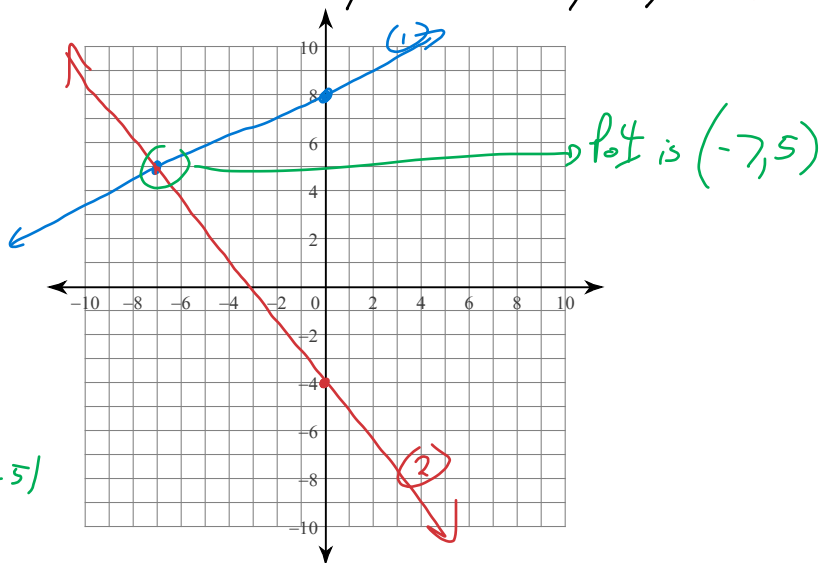
$$\left. \begin{array}{l} -54 + 18(3) + 8(0) = 0 \\ -54 + 54 + 0 = 0 \\ 0 = 0 \end{array} \right\} \begin{array}{l} 5(0) = 6(3) - 18 \\ 0 = 18 - 18 \\ 0 = 0 \end{array} \left\} \begin{array}{l} (3, 0) \text{ satisfies} \\ \text{both equations,} \\ \therefore (3, 0) \text{ is the} \\ \text{POI.} \end{array}$$

Solve by graphing. (3K)

3) $y = \frac{1}{2}x - 3$
 $y = 2x + 3$



4) $3x - 7y = -56 \rightarrow 3x + 56 = 7y \rightarrow y = \frac{3}{7}x + 8$ (1)
 $9x + 7y = -28 \rightarrow 7y = -9x - 28 \rightarrow y = -\frac{9}{7}x - 4$ (2)



Solve using the method prescribed. (4K each)

5) Substitution:

$$-9x + 4y = 9$$

$$7x + y = 30 \rightarrow y = -7x + 30$$

$$\begin{aligned} -9x + 4(-7x + 30) &= 9 & \left. \begin{aligned} y &= -7(3) + 30 \\ y &= -21 + 30 \\ y &= 9 \end{aligned} \right\} \\ -9x - 28x + 120 &= 9 \\ -37x &= -111 \\ \frac{-37x}{-37} &= \frac{-111}{-37} \\ x &= 3 \end{aligned}$$

\therefore P.o.I is (3, 9)

6) Elimination:

$$2(7x - y = 27) \rightarrow 14x - 2y = 54$$

$$14x - 10y = -10 \rightarrow -14x - 10y = -10$$

$$8y = 64$$

$$y = 8$$

$$7x - 8 = 27$$

$$7x = 35$$

$$x = 5$$

\therefore P.o.I is (5, 8)

Solve by either elimination or substitution. (6T)

$$2(3x - 2) + 5(y + 3) - 3(3y + 6) \rightarrow 6x - 4 + 5y + 15 - 9y - 18 = 6x - 4 + 5y - 6y + 15 - 9y - 18$$

$$3(x + 1) - 2(y - 3) = 11$$

$$3x + 3 - 2y + 6 = 11 - 9$$

$$6x - y = 1 \quad (1)$$

$$6x - 1 = y$$

$$(2) \quad 3x - 2y = 2$$

$$\rightarrow 3x - 2(6x - 1) = 2 \quad \left\{ \begin{aligned} y &= 6(0) - 1 \\ y &= -1 \end{aligned} \right.$$

$$3x - 12x + 2 = 2$$

$$-9x = 0$$

$$x = 0$$

\therefore P.o.I is (0, -1)