

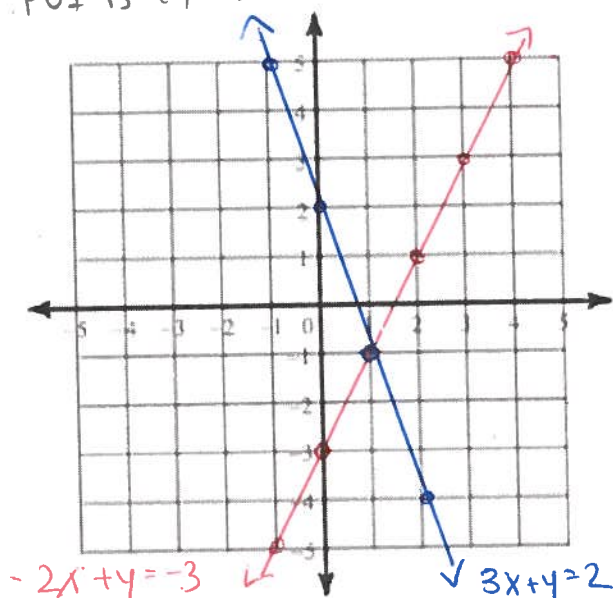
MPM2D – Unit 6 - Review Worksheet #2

Section 1 – Solving Linear Systems by Graphing

Solve each of the linear systems below by graphing.

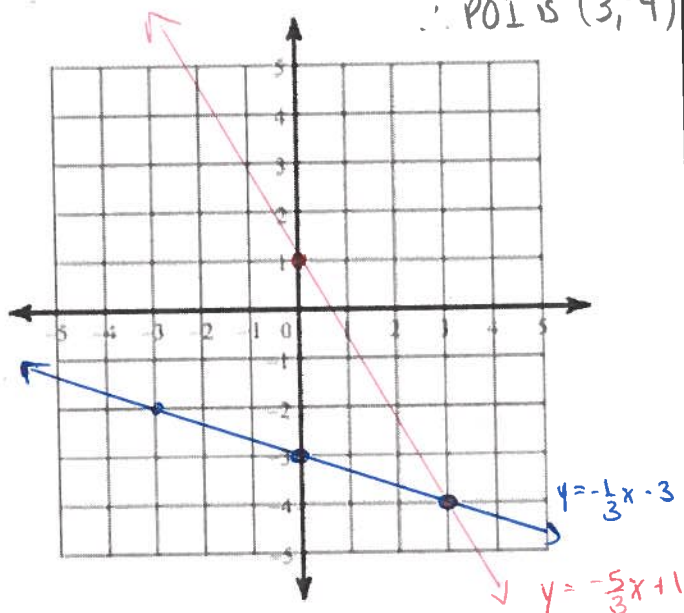
1. $-2x + y = -3 \Rightarrow y = 2x - 3$ $m = 2$
 $3x + y = 2 \Rightarrow y = -3x + 2$ $b = -3$
 $m = -3$
 $b = 2$

\therefore POI is $(1, -1)$

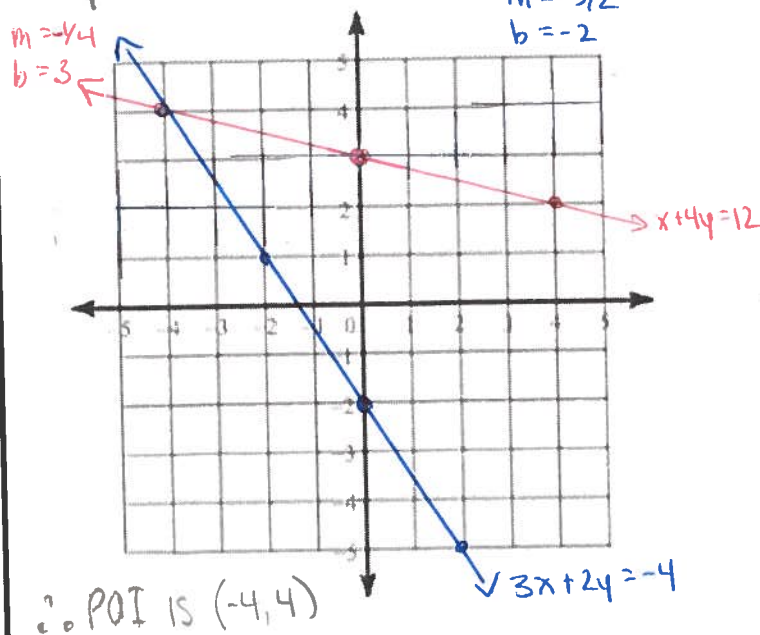


2. $y = -\frac{5}{3}x + 1$ $m = -5/3$
 $y = -\frac{1}{3}x - 3$ $b = 1$
 $m = -1/3$
 $b = -3$

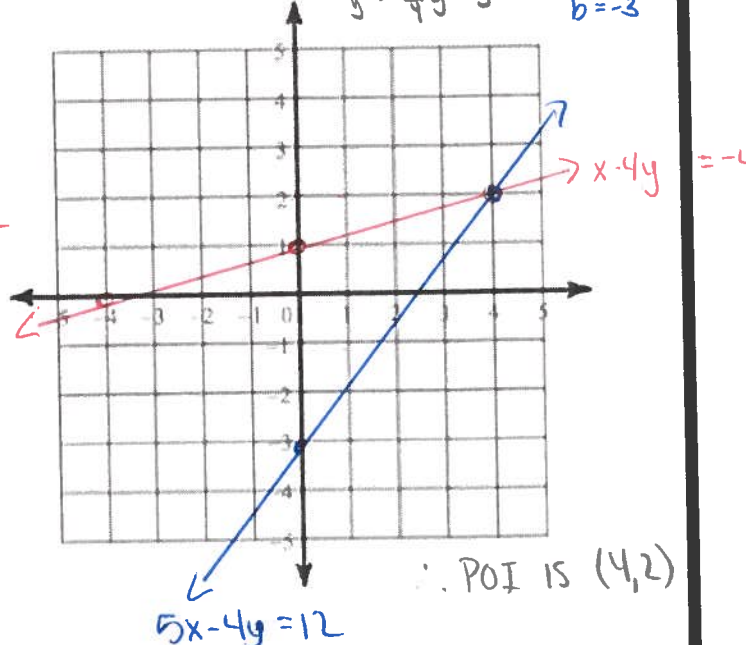
\therefore POI is $(3, -4)$



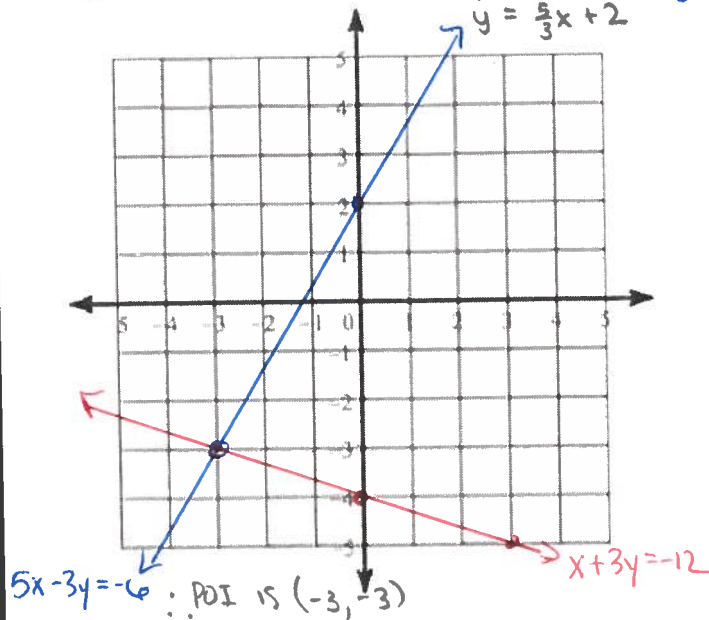
3. $x + 4y = 12 \Rightarrow y = -\frac{1}{4}x + 3$ $m = -1/4$
 $3x + 2y = -4 \Rightarrow y = -\frac{3}{2}x - 2$ $b = 3$
 $m = -3/2$
 $b = -2$



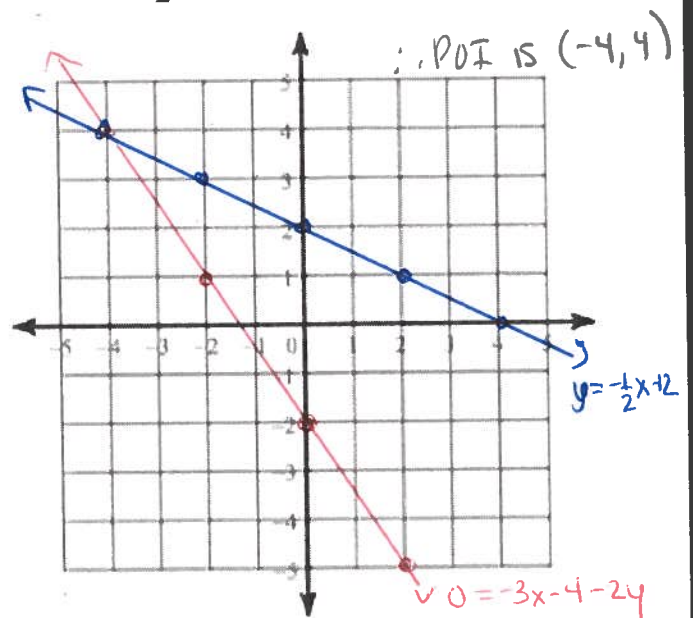
4. $x - 4y = -4 \Rightarrow y = \frac{1}{4}x + 1$ $m = 1/4$
 $5x - 4y = 12 \Rightarrow y = \frac{5}{4}x - 3$ $b = 1$
 $m = 5/4$
 $b = -3$



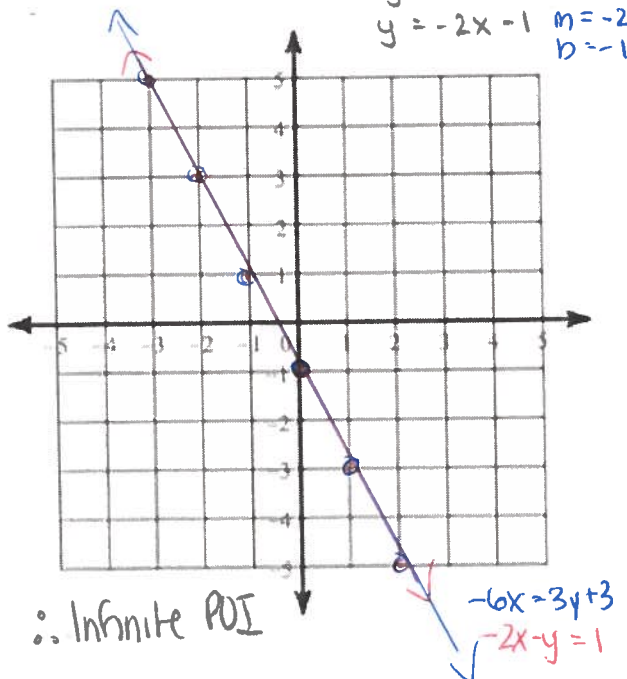
5. $x+3y=-12 \Rightarrow 3y=-x-12$
 $y=-\frac{1}{3}x-4$
 $5x-3y=-6 \Rightarrow -3y=-5x-6$
 $y=\frac{5}{3}x+2$
 $m=-\frac{1}{3}$ $b=-4$
 $m=\frac{5}{3}$ $b=2$



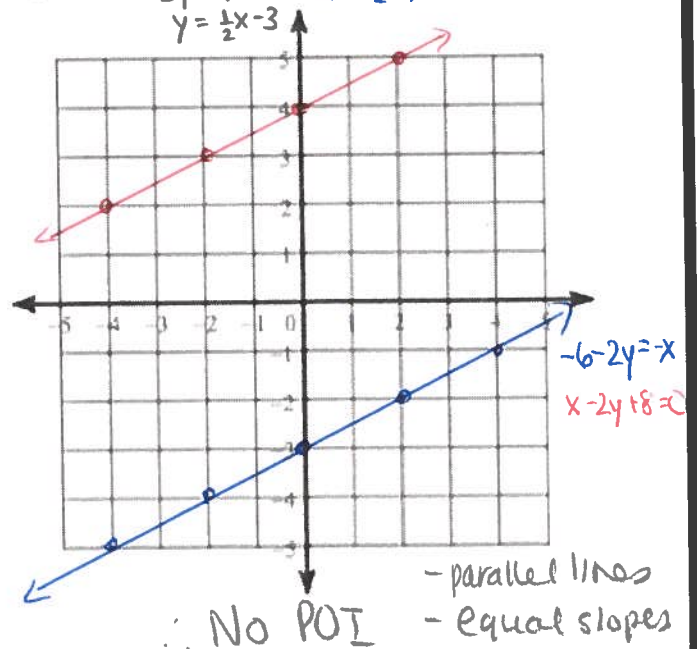
6. $0=-3x-4-2y$
 $2y=-3x-4$
 $y=-\frac{3}{2}x-2$
 $m=-\frac{3}{2}$
 $b=-2$
 $2-\frac{1}{2}x=y$
 $y=-\frac{1}{2}x+2$
 $m=-\frac{1}{2}$
 $b=2$



7. $-2x-y=1 \Rightarrow y=-2x-1$
 $m=-2$
 $b=-1$
 $-6x=3y+3 \Rightarrow 3y=-6x-3$
 $y=-2x-1$
 $m=-2$
 $b=-1$



8. $x-2y+8=0 \Rightarrow 2y=x+8$
 $m=\frac{1}{2}$
 $b=4$
 $-6-2y=-x$
 $2y=x-6$
 $y=\frac{1}{2}x-3$
 $m=\frac{1}{2}$
 $b=-3$



Answers

1. $(1, -1)$

2. $(3, -4)$

3. $(-4, 4)$

4. $(4, 2)$

5. $(-3, -3)$

6. $(-4, 4)$

7. Infinite POI

8. No POI

MPM2D - Unit 6 Review - worksheet #2 - Solutions.

Section 2

$$\begin{aligned} ① \quad & y = 2x + 1 \quad ① \\ & x + y = -2 \quad ② \end{aligned}$$

$$\begin{aligned} \text{Sub } ① \text{ into } ② \\ x + 2x + 1 &= -2 \\ 3x &= -3 \\ x &= -1 \end{aligned}$$

$$\begin{aligned} \text{Sub } x = -1 \text{ into } ① \\ y &= 2(-1) + 1 \\ &= -2 + 1 \\ &= -1 \end{aligned}$$

\therefore POI is $(-1, -1)$

$$\begin{aligned} 2) \quad & 3x - 2y = 6 \quad ① \\ & 3x + 2y = 6 \quad ② \end{aligned}$$

$$\begin{aligned} ① + ② \quad & 6x = 12 \\ & x = 2 \end{aligned}$$

$$\begin{aligned} \text{Sub } x = 2 \text{ into } ① \\ 3(2) - 2y &= 6 \\ -2y &= 6 - 6 \\ -2y &= 0 \\ y &= 0 \end{aligned}$$

\therefore POI is $(2, 0)$

$$\begin{aligned} 3) \quad & y = -\frac{1}{2}x + 4 \quad ① \\ & x + 2y = 8 \quad ② \end{aligned}$$

$$\begin{aligned} ① \times 2: \quad & 2y = -x + 8 \quad ③ \\ \text{Sub } ③ \text{ into } ② \quad & x + (-x + 8) = 8 \\ x - x &= 8 - 8 \\ 0 &= 0 \end{aligned}$$

\therefore infinite #
of POI

$$\begin{aligned} 4) \quad & 3x - 6y = 5 \quad ① \\ & -4x + 2y = -6 \quad ② \end{aligned}$$

$$\begin{aligned} ② \times 3: \quad & -12x + 6y = -18 \quad ③ \\ ③ + ①: \quad & -9x = -13 \end{aligned}$$

$$\begin{aligned} & 3x - 6y = 5 \quad ① \\ & -9x = -13 \\ x &= \frac{13}{9} \end{aligned}$$

$$\begin{aligned} ① \times 4: \quad & 12x - 24y = 20 \quad ④ \\ & -12x + 6y = -18 \quad ③ \end{aligned}$$

$$\begin{aligned} ④ + ③: \quad & -18y = -2 \\ y &= \frac{1}{9} \end{aligned}$$

\therefore POI is $(\frac{13}{9}, \frac{1}{9})$

$$\begin{aligned} 5) \quad & 3x - 5y = 4 \quad ① \\ & -3x + 4y = -8 \quad ② \end{aligned}$$

$$\begin{aligned} ① + ②: \quad & -y = -4 \\ y &= 4 \end{aligned}$$

$$\begin{aligned} \text{Sub } y = 4 \text{ into } ① \\ 3x - 5(4) &= 4 \\ 3x - 20 &= 4 \end{aligned}$$

$$\begin{aligned} 3x &= 24 \\ x &= 8 \end{aligned}$$

\therefore POI is $(8, 4)$

$$\begin{aligned} 6) \quad & 2y = x + 6 \quad ① \\ & -3x + 2y = -2 \quad ② \end{aligned}$$

$$\begin{aligned} \text{Sub } ① \text{ into } ② \\ -3x + x + 6 &= -2 \\ -2x &= -8 \\ x &= 4 \end{aligned}$$

$$\begin{aligned} \text{Sub } x = 4 \text{ into } ① \\ 2y &= 4 + 6 \\ 2y &= 10 \\ y &= 5 \end{aligned}$$

\therefore POI is $(4, 5)$

$$7) -9x + 6y = 3 \quad (1)$$

$$18x + 30y = 1 \quad (2)$$

$$(1) \times 2: -18x + 12y = 6 \quad (3)$$

$$(2) + (3): 42y = 7$$

$$y = \frac{1}{6}$$

$$\text{Sub } y = \frac{1}{6} \text{ into } (1)$$

$$-9x + 6\left(\frac{1}{6}\right) = 3$$

$$-9x + 1 = 3$$

$$-9x = 2$$

$$x = -\frac{2}{9}$$

$$\therefore \text{POI is } \left(-\frac{2}{9}, \frac{1}{6}\right)$$

$$8) 7x - 5y = -1 \quad (1)$$

$$-3x + 5y = 9 \quad (2)$$

$$(1) + (2): 4x = 8$$

$$x = 2$$

$$\text{Sub } x = 2 \text{ into } (1)$$

$$7(2) - 5y = -1$$

$$14 - 5y = -1$$

$$-5y = -15$$

$$y = 3$$

$$\therefore \text{POI is } (2, 3)$$

$$9) -3x + 5y = 1 \quad (1)$$

$$9x - 3y = 5 \quad (2)$$

$$(1) \times 3: -9x + 15y = 3 \quad (3)$$

$$(2) + (3): 12y = 8$$

$$y = \frac{8}{12}$$

$$y = \frac{2}{3}$$

$$\text{Sub } y = \frac{2}{3} \text{ into } (2)$$

$$9x - 3\left(\frac{2}{3}\right) = 5$$

$$9x - 2 = 5$$

$$9x = 7$$

$$x = \frac{7}{9}$$

$$\therefore \text{POI is } \left(\frac{7}{9}, \frac{2}{3}\right)$$

$$10) 3x + 4y = -5 \quad (1)$$

$$5x + 6y = -7 \quad (2)$$

$$(1) \times 5: 15x + 20y = -25 \quad (3)$$

$$(2) \times -3: -15x - 18y = 21 \quad (4)$$

$$(3) + (4): 2y = -4$$

$$y = -2$$

$$\text{Sub } y = -2 \text{ into } (1)$$

$$3x + 4(-2) = -5$$

$$3x - 8 = -5$$

$$3x = 3$$

$$x = 1$$

$$\therefore \text{POI is } (1, -2)$$

$$11) 2x - 5y = 13 \quad (1)$$

$$3x + 4y = -15 \quad (2)$$

$$(1) \times 3: 6x - 15y = 39 \quad (3)$$

$$(2) \times -2: -6x - 8y = 30 \quad (4)$$

$$(3) + (4): -23y = 69$$

$$y = -3$$

$$\text{Sub } y = -3 \text{ into } (1)$$

$$2x - 5(-3) = 13$$

$$2x + 15 = 13$$

$$2x = -2$$

$$x = -1$$

$$\therefore \text{POI is } (-1, -3)$$

$$12) x + y = 48 \quad (1)$$

$$12x + 14y = 628 \quad (2)$$

$$(1) \times -12: -12x - 12y = -576 \quad (3)$$

$$(2) + (3): 2y = 52$$

$$y = 26$$

$$\text{Sub } y = 26 \text{ into } (1)$$

$$x + 26 = 48$$

$$x = 22$$

$$\therefore \text{POI is } (22, 26)$$

$$13. \quad 0.24x + 0.16y = 0.58 \quad (1) \quad 14) \quad 0.18x + 0.27y = 0.09 \quad (1)$$

$$0.8x - 0.12y = 0.52 \quad (2) \quad 0.06x - 0.54y = -0.04 \quad (2)$$

$$(1) \times 100 \quad 24x + 16y = 58 \quad (3)$$

$$(1) \times 100: \quad 18x + 27y = 9 \quad (3)$$

$$(2) \times 100 \quad 80x - 12y = 52 \quad (4)$$

$$(2) \times 100: \quad 6x - 54y = -4 \quad (4)$$

$$(4) \times 5 \quad 400x - 60y = 260 \quad (5)$$

$$(4) \times -3: \quad -18x + 162y = 12 \quad (5)$$

$$(3) + (5) \quad 424x = 318$$

$$(3) + (5) \quad 189y = 21$$

$$x = \frac{318}{424}$$

$$y = 21/189$$

$$y = 1/9$$

$$x = 3/4$$

$$\text{Sub } x = 3/4 \text{ into } (3)$$

$$(3) \times 2: \quad 36x + 54y = 18 \quad (6)$$

$$24(3/4) + 16y = 58$$

$$6x - 54y = -4 \quad (4)$$

$$18 + 16y = 58$$

$$(6) + (4) \quad 42x = 14$$

$$16y = 40$$

$$x = 14/42$$

$$y = 40/160$$

$$x = 1/3$$

$$y = 4/16$$

$$\therefore \text{POI is } (1/3, 1/9)$$

$$y = 2/3$$

$$\therefore \text{POI is } (3/4, 2/3)$$

$$15) \quad 1/4x + 1/3y = 5 \quad (1)$$

$$16) \quad 3x/2 - 2y/3 = 10 \quad (1)$$

$$x - y = 6 \quad (2)$$

$$1/2x + 1/2y = -1 \quad (2)$$

$$(1) \times 12: \quad 3x + 4y = 60 \quad (3)$$

$$(1) \times 6: \quad 9x - 4y = 60 \quad (3)$$

$$(2) \times 4 \quad 4x - 4y = 24 \quad (4)$$

$$(2) \times 2 \quad x + y = -2 \quad (4)$$

$$(3) + (4) \quad 7x = 84$$

$$(4) \times 4 \quad 4x + 4y = -8 \quad (5)$$

$$(3) + (5) \quad \frac{13x}{13} = \frac{52}{13}$$

$$x = 12$$

$$x = 4$$

$$\text{Sub } x = 12 \text{ into } (2)$$

$$\text{Sub } x = 4 \text{ into } (4)$$

$$12 - y = 6$$

$$4 + y = -2$$

$$12 - 6 = y$$

$$y = -6$$

$$y = 6$$

$$\therefore \text{POI is } (12, 6)$$

$$\therefore \text{POI is } (4, -6)$$

17.

$$x/3 - y/2 = -5/6 \quad (1)$$

$$x/5 - y/3 = -3/5 \quad (2)$$

$$(1) \times 6: 2x - 3y = -5 \quad (3)$$

$$(2) \times 15: 3x - 5y = -9 \quad (4)$$

$$(3) \times 3: 6x - 9y = -15 \quad (5)$$

$$(4) \times -2: -6x + 10y = 18 \quad (6)$$

$$(5) + (6) \quad y = 3$$

Sub $y=3$ into (3)

$$2x - 3(3) = -5$$

$$2x - 9 = -5$$

$$2x = 4$$

$$x = 2$$

 \therefore POI is $(2, 3)$

18) $\frac{1}{8}x + \frac{1}{4}y = 5 \quad (1)$

$$\frac{1}{16}x - \frac{1}{2}y = 7 \quad (2)$$

$$(1) \times 16: 2x + 4y = 80 \quad (3)$$

$$(2) \times 16: x - 8y = 112 \quad (4)$$

$$(3) \times 2: 4x + 8y = 160 \quad (5)$$

$$(4) + (5) \quad \frac{5x}{5} = \frac{272}{5}$$

$$x = 272/5$$

$$2x + 4y = 80 \quad (3)$$

$$(4) \times -2: -2x + 16y = -224 \quad (6)$$

$$(3) + (6) \quad \frac{20y}{20} = \frac{-144}{20}$$

$$y = -36/5$$

 \therefore POI is $(\frac{272}{5}, -\frac{36}{5})$

MPM2D - Unit 6 - Review worksheet #2 - Solutions

Section 3 -

1. let x be the cost of one doughnut
 " y " " " " " cup of coffee.

$$3x + 2y = 3.40 \quad (1)$$

$$2x + 3y = 3.60 \quad (2)$$

$$(1) \times -2 \quad -6x - 4y = -6.80 \quad (3)$$

$$(2) \times 3 \quad 6x + 9y = 10.80 \quad (4)$$

$$(3) + (4) \quad 5y = 4$$

$$y = 0.80$$

Sub $y = 0.80$ into (1)

$$3x + 2(0.80) = 3.40$$

$$3x + 1.60 = 3.40$$

$$3x = 1.80$$

$$x = 0.60$$

\therefore A doughnut costs
 $\$0.60$ and a
 cup of coffee
 costs $\$0.80$.

2. let x be the price of one book
 " y " " " " " magazine.

$$4x + 3y = 1.45 \quad (1)$$

$$2x + 5y = 1.25 \quad (2)$$

$$(2) \times -2 \quad -4x - 10y = -2.50 \quad (3)$$

$$(1) + (3) \quad -7y = -1.05$$

$$y = 0.15$$

Sub $y = 0.15$ into (1)

$$4x + 3(0.15) = 1.45$$

$$4x + 0.45 = 1.45$$

$$4x = 1.00$$

$$x = 0.25$$

\therefore Each book was
 $25¢$ and each
 magazine was
 $15¢$

$$3. \begin{array}{|c|} \hline \text{D.D. choc} \\ X \\ 0.35 \\ \hline 0.35x \\ \hline \end{array} + \begin{array}{|c|} \hline \text{P.B.} \\ Y \\ 0.25 \\ \hline 0.25y \\ \hline \end{array} = \begin{array}{|c|} \hline 50 \\ 0.29 \\ \hline 14.5 \\ \hline \end{array}$$

let x be the amt of double dark chocolate fudge used +
 y " " " " " " peanut butter fudge used in the mix.

$$\begin{aligned} X + y &= 50 & (1) \\ 0.35x + 0.25y &= 14.5 & (2) \\ (2) \times 100: & & \\ 35x + 25y &= 1450 & (3) \\ -35x - 35y &= -1750 & (4) \\ \hline -10y &= -300 & \\ y &= 30 & \end{aligned}$$

$$\begin{aligned} (2) \times 100: \\ (1) \times -35 \\ (3) + (4) \end{aligned}$$

$$\begin{aligned} \text{Sub } y=30 \text{ into } (1) \\ X + 30 &= 50 \\ X &= 20 \end{aligned}$$

\therefore They will mix 20 lbs of
 double dark choc. fudge w 30 lbs
 of peanut butter fudge.

4. let x be the # of \$200 tickets sold +
 y " " " " " " \$250 " "

$$\begin{aligned} X + y &= 200 & (1) \\ 200x + 250y &= 44000 & (2) \\ (1) \times -200 & & \\ -200x - 200y &= -40000 & (3) \\ \hline 50y &= 4000 & \\ y &= 80 & \end{aligned}$$

$$\begin{aligned} (1) \times -200 \\ (2) + (3) \end{aligned}$$

$$\begin{aligned} \text{Sub } y=80 \text{ into } (1) \\ X + 80 &= 200 \\ X &= 120 \end{aligned}$$

\therefore 120 tickets were sold for \$200 +
 80 " " " " " \$250.

5. let x be the # of student tickets sold +
 y " " " " " " nonstudent " "

$$\begin{aligned} X + y &= 150 & (1) \\ 5x + 8y &= 930 & (2) \\ (1) \times -5: & & \\ -5x - 5y &= -750 & (3) \\ \hline 3y &= 180 & \\ y &= 60 & \end{aligned}$$

$$\begin{aligned} (1) \times -5: \\ (2) + (3) \end{aligned}$$

$$\begin{aligned} \text{Sub } y=60 \text{ into } (1) \\ X + 60 &= 150 \\ X &= 90 \end{aligned}$$

\therefore 90 student tickets + 60
 non-student tickets
 were sold.

6.

$$\begin{array}{c} x \\ \left[\begin{array}{c} 0.05 \\ 0.105x \end{array} \right] + \begin{array}{c} y \\ \left[\begin{array}{c} 0.25 \\ 0.125y \end{array} \right] = \begin{array}{c} 50L \\ \left[\begin{array}{c} 0.2 \\ 10 \end{array} \right] \end{array}$$

Let x be the amt of 5% solⁿ used +
 y " " " " 25% " "

$$x + y = 50 \quad (1)$$

$$0.105x + 0.125y = 10 \quad (2)$$

$$5x + 25y = 1000 \quad (3)$$

$$-5x - 5y = -250 \quad (4)$$

$$20y = 750$$

$$y = 750/20$$

$$y = 75/2$$

Sub $y = 75/2$ into (1).

$$x + 75/2 = 50$$

$$x = 100/2 - 75/2$$

$$x = 25/2$$

$\therefore \frac{25}{2}L$ of the 5% solⁿ is
 mixed with $\frac{75}{2}L$ of 25% solⁿ

(2) $\times 100$

(1) $\times -5$

7.

$$\begin{array}{c} x \\ \left[\begin{array}{c} 0.02 \\ 0.02x \end{array} \right] + \begin{array}{c} y \\ \left[\begin{array}{c} 0.10 \\ 0.10y \end{array} \right] = \begin{array}{c} 40 \\ \left[\begin{array}{c} 0.08 \\ 3.2 \end{array} \right] \end{array}$$

Let x be the amt of 2% fertilizer mixed +
 y " " " " 10% " "

$$x + y = 40 \quad (1)$$

$$0.02x + 0.10y = 3.2 \quad (2)$$

$$2x + 10y = 320 \quad (3)$$

$$-2x - 2y = -80 \quad (4)$$

$$8y = 240$$

$$y = 30$$

Sub $y = 30$ into (1)

$$x + 30 = 40$$

$$x = 10$$

$\therefore 10L$ of 2% fertilizer is
 mixed w/ 30L of 10%
 fertilizer.

(2) $\times 100$

(1) $\times -2$

(3) + (4)

8. Let x be the cost of one roll of streamers +
 y " " " " " a party hat

$$3x + 15y = 30 \quad (1)$$

$$2x + 4y = 11 \quad (2)$$

$$-6x - 30y = -160 \quad (3)$$

$$6x + 12y = 33 \quad (4)$$

$$-18y = -27$$

$$y = 1.50$$

Sub $y = 1.50$ into (1)

$$3x + 15(1.50) = 30$$

$$3x = 30 - 22.50$$

$$3x = 7.50$$

$$x = 2.50$$

\therefore A roll of
 streamers is \$2.50
 and a party hat
 costs \$1.50

(1) $\times -2$

(2) $\times 3$

(3) + (4)

9. let x be the # of adult tickets sold &
 " y " " " " children " "

$$x + y = 7 \quad (1)$$

$$12x + 9y = 72 \quad (2)$$

$$\begin{array}{r} (1) \times -12 \\ -12x - 12y = -84 \end{array} \quad (3)$$

$$\begin{array}{r} (2) + (3) \\ -3y = -12 \end{array}$$

$$y = 4$$

$$\text{Sub } y = 4 \text{ into } (1)$$

$$x + 4 = 7$$

$$x = 3$$

\therefore 3 adult & 4 child tickets were sold

10. let x be the # of motorcycles sold &
 " y " " " " cars "

$$x + y = 200 \quad (1)$$

$$2x + 4y = 698 \quad (2)$$

$$\begin{array}{r} (1) \times -2 \\ -2x - 2y = -400 \end{array} \quad (3)$$

$$(2) + (3)$$

$$2y = 298$$

$$y = 149$$

$$\text{Sub } y = 149 \text{ into } (1)$$

$$x + 149 = 200$$

$$x = 51$$

\therefore There are 51 motorcycles sold & 149 cars sold.

11. let x be the # of cars washed &
 " y " " " " trucks/SUVs "

$$x + y = 75 \quad (1)$$

$$3x + 5y = 275 \quad (2)$$

$$\begin{array}{r} (1) \times -3 \\ -3x - 3y = -225 \end{array} \quad (3)$$

$$(2) + (3)$$

$$2y = 50$$

$$y = 25$$

$$\text{Sub } y = 25 \text{ into } (1)$$

$$x + 25 = 75$$

$$x = 50$$

\therefore 50 cars and 25 trucks/SUVs were washed.

12.

$$\begin{array}{c} \text{FF} \\ X \\ 0.32 \\ 0.32x \end{array} + \begin{array}{c} \text{MS} \\ y \\ 0.14 \\ 0.14y \end{array} = \begin{array}{c} \text{JR} \\ 5\text{kg} \\ 0.20 \\ 1 \end{array}$$

let x be the amt of Fruit First used +
 " y " " " " " Morning Sunshine "

$$X + y = 5 \quad (1)$$

$$0.32x + 0.14y = 1 \quad (2)$$

$$(2) \times 100$$

$$32x + 14y = 100 \quad (3)$$

$$(1) \times -32$$

$$-32x - 32y = -160 \quad (4)$$

$$(3) + (4)$$

$$\begin{array}{r} -18y = -60 \\ -18 \quad -18 \\ \hline y = 10/3 \\ y = 3.33 \end{array}$$

Sub $y = 10/3$ into (1)

$$X + 10/3 = 5$$

$$X = 5/3 - 10/3$$

$$X = 5/3$$

$$X = 1.67$$

$\therefore 5/3$ kg of Fruit First is mixed
 w/ $10/3$ kg of Morning Sunshine.

13.

$$\begin{array}{c} 3.6 \\ 0.18 \\ 0.18x \end{array} + \begin{array}{c} X \\ 1.00 \\ 1x \end{array} = \begin{array}{c} y \\ 0.30 \\ 0.30y \end{array}$$

let x be the amt of raisins added +
 " y " " " " " new mix made.

$$3.6 + x = y \quad (1)$$

$$0.18x + 1.00y = 0.30y \quad (2)$$

$$(2) \times 1000$$

$$180x + 1000y = 300y \quad (3)$$

$$(1) \times -1000$$

$$-3600 - 1000x = -1000y \quad (4)$$

$$(3) + (4)$$

$$\begin{array}{r} -2952 = -700y \\ -700 \quad -700 \\ \hline y = 4.22 \end{array}$$

Sub $y = 4.22$ into (1)

$$3.6 + x = 4.22$$

$$x = 0.62$$

$\therefore 0.62$ kg of raisins are added
 to make 4.22 kg of
 mixture.

14.

$$\begin{array}{c} X \\ 0.60 \\ 0.60x \end{array} + \begin{array}{c} y \\ 0.40 \\ 0.40y \end{array} = \begin{array}{c} 12.4 \\ 0.50 \\ 6.2 \end{array}$$

let x be the amt of 60% gold mixed +
 " y " " " " " 40% " "

$$X + y = 12.4 \quad (1)$$

$$0.60x + 0.40y = 6.2 \quad (2)$$

$$60x + 40y = 620 \quad (3)$$

$$-60x - 60y = -744 \quad (4)$$

$$-20y = -124$$

$$y = -124/-20$$

$$y = 6.2$$

$$\text{Sub } y = 6.2 \text{ into (1)}$$

$$X + 6.2 = 12.4$$

$$X = 6.2$$

$\therefore 6.2$ lbs of 60% gold is
 mixed w/ 6.2 lbs of
 40% gold.

$$(2) \times 100$$

$$(1) \times -60$$

$$(3) + (4)$$

$$15. \begin{array}{|c|} \hline x \\ \hline 8.90 \\ \hline 8.90x \\ \hline \end{array} + \begin{array}{|c|} \hline y \\ \hline 9.50 \\ \hline 9.50y \\ \hline \end{array} = \begin{array}{|c|} \hline 15.3 \\ \hline 9.10 \\ \hline 139.23 \\ \hline \end{array}$$

Let x be the amt of Copper used &
 " y " " " " Tin "

$$x + y = 15.3 \quad (1)$$

$$8.90x + 9.50y = 139.23 \quad (2)$$

- (1) $\times 10$
 (2) $\times 100$
 (3) $\times -89$

$$10x + 10y = 153 \quad (3)$$

$$890x + 950y = 13923 \quad (4)$$

$$-890x - 890y = -13619 \quad (5)$$

$$\frac{60y}{60} = \frac{306}{60}$$

$$y = 5.1$$

Sub $y = 5.1$ into (1)

$$x + 5.1 = 15.3$$

$$x = 10.2$$

$\therefore 10.2 \text{ kg}$ of copper is mixed with 5.1 kg of tin.

$$16. \begin{array}{|c|} \hline x \\ \hline 4.20 \\ \hline 4.20x \\ \hline \end{array} + \begin{array}{|c|} \hline 12 \\ \hline 2.25 \\ \hline 27 \\ \hline \end{array} = \begin{array}{|c|} \hline y \\ \hline 3.40 \\ \hline 3.40y \\ \hline \end{array}$$

Let x be the amt of \$4.20/lb tea & y be the amt of \$3.40/lb tea mixed.

$$x + 12 = y \quad (1)$$

Sub $y = 29.25$ into (1)

$$4.20x + 27 = 3.40y \quad (2)$$

$$x + 12 = 29.25$$

$$x = 17.25$$

- (2) $\times 100$
 (1) $\times -420$
 (3) + (4)

$$420x + 2700 = 340y \quad (3)$$

$$-420x - 5540 = -420y \quad (4)$$

$$-2340 = -80y$$

$$y = 29.25$$

$\therefore 17.25 \text{ lbs}$ of the \$4.20/lb tea will be mixed to make 29.25 lbs of the new mix.

$$17. \begin{array}{|c|} \hline x \\ \hline 0.1 \\ \hline 0.1x \\ \hline \end{array} + \begin{array}{|c|} \hline y \\ \hline 0.6 \\ \hline 0.6y \\ \hline \end{array} = \begin{array}{|c|} \hline 100 \\ \hline 0.45 \\ \hline 45 \\ \hline \end{array}$$

Let x be the amt of 10% butterfat used &
 y " " " " 60% " "

$$x + y = 100 \quad (1)$$

$$0.1x + 0.6y = 45 \quad (2)$$

$$x + 6y = 450 \quad (3)$$

$$-x - y = -100 \quad (4)$$

- (2) $\times 10$
 (1) $\times -1$
 (3) + (4)

$$5y = 350$$

$$y = 70$$

Sub $y = 70$ into (1)

$$x + 70 = 100$$

$$x = 30$$

$\therefore 30 \text{ quarts}$ of 10% milk will be mixed with 70 quarts of 60% milk.

MPM2D - Unit 6 Review Worksheet #2

Section 4

1. $P(-3, 14)$ $y = -\frac{1}{6}x - 5$

1) $m = -\frac{1}{6}$

2) $m_{\perp} = 6$

3) $y = mx + b$

$14 = 6(-3) + b$

$14 = -18 + b$

$b = 32$

$y = 6x + 32$

4) $y = -\frac{1}{6}x - 5$ ①

$y = 6x + 32$ ②

① $\times 6$

③ $\times 6$

$6y = -x - 30$ ③

$36y = -6x - 180$ ④

$y = 6x + 32$ ②

$37y = -148$

$y = -4$

Sub $y = -4$ into ②

$-4 = 6x + 32$

$-36 = 6x$

$x = -6$

\therefore POI is $(-6, -4)$

$(-6, -4)$

$(-3, 14)$

5) $L^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$
 $= (-3 - (-6))^2 + (14 - (-4))^2$
 $= (-3 + 6)^2 + (14 + 4)^2$
 $= 3^2 + 18^2$
 $= 9 + 324$
 $= 333$

$L = \sqrt{333}$ units

$L \approx 18.25$ units

2. $P(-17, 33)$ $y = 5/8 x - 12$

1) $m = 5/8$

2) $m_{\perp} = -8/5$

3) $y = mx + b$

$33 = (-8/5)(-17/1) + b$

$33 = 136/5 + b$

$165/5 - 136/5 = b$

$b = 29/5$

$y = -\frac{8}{5}x + \frac{29}{5}$

4) $y = 5/8 x - 12$ (1)

$y = -8/5 x + 29/5$ (2)

(1) $\times 8$

$8y = 5x - 96$ (3)

(2) $\times 5$

$5y = -8x + 29$ (4)

from (3)

$-5x + 8y = -96$ (5)

from (4)

$8x + 5y = 29$ (6)

(5) $\times 8$

$-40x + 64y = -768$ (7)

(6) $\times 5$

$40x + 25y = 145$ (8)

(7) $+$ (8)

$89y = 1623$

$y = 7$

Sub $y = 7$ into (3)

$8(-7) = 5x - 96$

$-56 = 5x - 96$

$96 - 56 = 5x$

$5x = 40$

$x = 8$

\therefore The POT is $(8, 7)$

$(-17, 33)$

$(8, 7)$

5) $L^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$

$= (8 - (-17))^2 + (7 - 33)^2$

$= (8 + 17)^2 + (-40)^2$

$= (25)^2 + (-40)^2$

$= 625 + 1600$

$= 2225$

$L = \sqrt{2225}$ units

$L \approx 47.17$ units

3. $P(2, 3.5)$ $25x + 10y = -31$

1) $m: 25x + 10y = -31$

$$\frac{10y}{10} = \frac{-25x - 31}{10}$$

$$y = -\frac{5}{2}x - \frac{31}{10}$$

$$m = -5/2$$

2) $m_{\perp} = 2/5$

$$= 0.4$$

3) $y = mx + b$

$$3.5 = (0.4)(2) + b$$

$$3.5 = 0.8 + b$$

$$b = 2.7$$

$$y = 0.4x + 2.7$$

4) $25x + 10y = -31$ ①

$$y = 0.4x + 2.7$$
 ②

$$10y = 4x + 27$$
 ③

$$-4x + 10y = 27$$
 ④

$$-25x - 10y = 31$$
 ⑤

$$-29x = 58$$

$$-29 \quad -29$$

$$x = -2$$

Sub $x = -2$ into ②

$$y = 0.4(-2) + 2.7$$

$$= -0.8 + 2.7$$

$$= 1.9$$

\therefore The POI is $(-2, 1.9)$

② $\times 10:$

from ③:

① $\times -1:$

④ $+$ ⑤

$P_1(2, 3.5)$

$P_2(-2, 1.9)$

5) $L^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$

$$= (2 - (-2))^2 + (3.5 - 1.9)^2$$

$$= (4)^2 + (1.6)^2$$

$$= 16 + 2.56$$

$$= 18.56$$

$$L = \sqrt{18.56} \text{ units}$$

or

$$L = 4.31 \text{ units}$$

4. P(6, -7/3) $X - 3y = -12$

1) m: $X - 3y = -12$
 $\frac{-3y}{-3} = \frac{-X - 12}{-3}$

$y = \frac{1}{3}X + 4$

$m = 1/3$

2) $m_{\perp} = -3$

3) $y = mx + b$
 $-\frac{7}{3} = -3(6) + b$

$-\frac{7}{3} = -18 + b$

$-\frac{7}{3} + \frac{54}{3} = b$

$b = \frac{47}{3}$

$y = -3x + \frac{47}{3}$

4) $X - 3y = -12$ ①

$y = -3x + \frac{47}{3}$ ②

$3y = -9x + 47$ ③

$9x + 3y = 47$ ④

$X - 3y = -12$ ①

$\frac{10x}{10} = \frac{35}{10}$

$x = \frac{7}{2}$

Sub $x = \frac{7}{2}$ into ①

$\frac{7}{2} - 3y = -12$

$\frac{7}{2} - 6y = -24$

$-6y = -24 - \frac{7}{2}$

$\frac{-6y}{-6} = \frac{-31}{-6}$

$y = \frac{31}{6}$

\therefore The POI is $(\frac{7}{2}, \frac{31}{6})$

5) $L^2 = (x_2 - x_1)^2 + (y_2 - y_1)^2$

$= (6 - \frac{7}{2})^2 + (-\frac{7}{3} - \frac{31}{6})^2$

$= (\frac{12}{2} - \frac{7}{2})^2 + (-\frac{14}{6} - \frac{31}{6})^2$

$= (\frac{5}{2})^2 + (-\frac{45}{6})^2$

$= \frac{25 \times 1}{4} + \frac{2025}{36}$

$= \frac{225}{36} + \frac{2025}{36}$

$L = \sqrt{\frac{2250}{36}}$ units

$= \sqrt{62.5}$ units

$L = 7.91$ units

MPM2D- Unit 6 - Review Worksheet #2 - Solutions.

Part 5.

1. line #1 (top) $b = 7$ $m = \frac{1}{3}$ $y = \frac{1}{3}x + 7$

line #2 (bottom) $b = 3$ $m = \frac{2}{5}$ $y = \frac{2}{5}x + 3$

$y = \frac{1}{3}x + 7$ ① $y = \frac{2}{5}x + 3$ ②

① $\times 3$:

$3y = x + 21$ ③

Sub $y = 27$ into ③

② $\times 5$:

$5y = 2x + 15$ ④

$3(27) = x + 21$

③ $\times -2$

$-6y = -2x - 42$ ⑤

$54 = x + 21$

④ $+ ⑤$

$-y = -27$

$-21 \quad -21$

$y = 27$

$x = 33$

\therefore The POI is $(33, 27)$

2. line #1 (top) $m = -\frac{3}{5}$ $b = 1$

line #2 (bottom) $m = -\frac{2}{3}$ $b = -4$

$y = -\frac{3}{5}x + 1$ ①

$y = -\frac{2}{3}x - 4$ ②

① $\times 5$:

$5y = -3x + 5$ ③

② $\times 3$: $3y = -2x - 12$ ④

③ $\times -3$:

$-15y = 9x - 15$ ⑤

Sub $x = -75$ into ④

④ $\times 5$:

$15y = -10x - 60$ ⑥

$3y = -2(-75) - 12$

⑤ $+ ⑥$

$0 = -x - 75$

$3y = 150 - 12$

$x = -75$

$\frac{3y}{3} = \frac{138}{3}$

$y = 46$

\therefore The POI is $(-75, 46)$