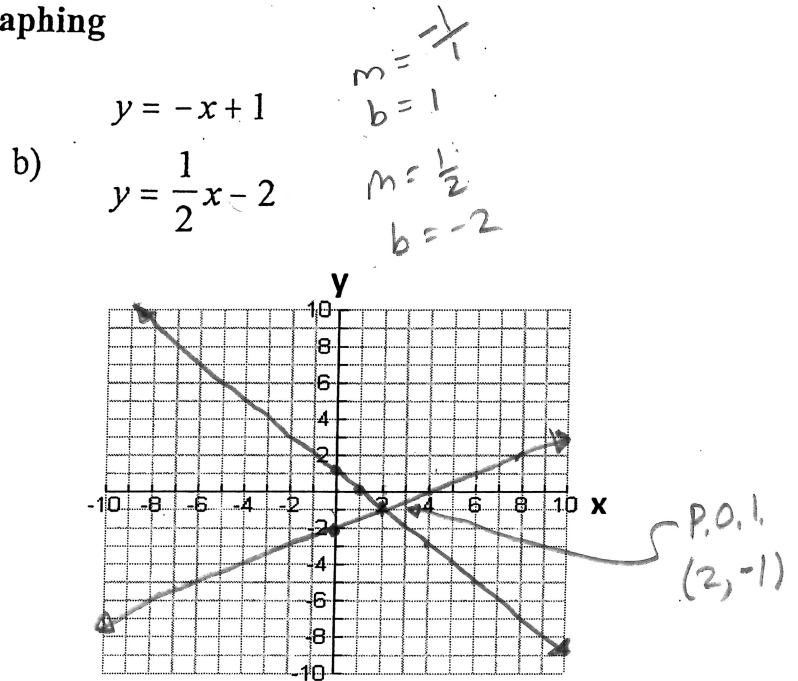
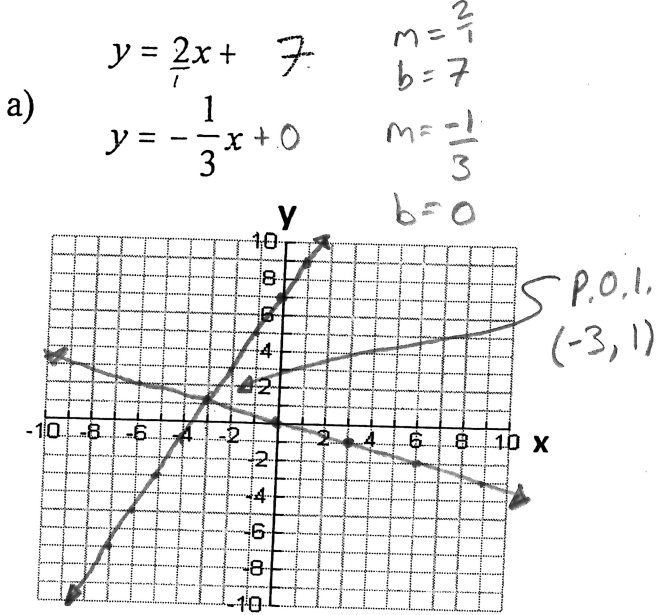


Unit 5: Linear System Practice

1. Find the point of intersection by graphing



2. Solve the following systems using substitution

a)

$$\begin{aligned} \textcircled{1} & 2x + 3y = 16 \\ \textcircled{2} & 3x + y = 10 \end{aligned}$$

Isolate y in $\textcircled{2}$

$$\textcircled{3} y = (10 - 3x) \text{ new } \textcircled{2}$$

Sub $\textcircled{3}$ into $\textcircled{1}$

$$2x + 3(10 - 3x) = 16$$

$$2x + 30 - 9x = 16$$

$$-7x + 30 = 16$$

$$-7x = 16 - 30$$

$$-7x = -14$$

$$\frac{-7x}{-7} = \frac{-14}{-7}$$

$$\textcircled{4} x = 2$$

Sub $\textcircled{4}$ into $\textcircled{3}$

$$y = 10 - 3(2)$$

$$y = 10 - 6$$

$$y = 4$$

\therefore The P.O.I. is (2, 4)

b)

$$\begin{aligned} \textcircled{1} & y = 3x \\ \textcircled{2} & y = (5x - 2) \end{aligned}$$

Sub $\textcircled{2}$ into $\textcircled{1}$

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

$$5x - 3x = 2$$

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

$$\textcircled{3} x = 1$$

Sub $\textcircled{3}$ into $\textcircled{1}$

$$y = 3(1)$$

$$y = 3$$

\therefore The P.O.I. is (1, 3)

3. Solve the following system using elimination

a)

$$\begin{aligned} \textcircled{1} & 3x - 2y = -16 \\ \textcircled{2} & 4x + 2y = 2 \end{aligned}$$

$$\textcircled{1} + \textcircled{2} \quad \frac{7x}{7} = \frac{-14}{7}$$

$$\textcircled{3} x = -2$$

Sub $\textcircled{3}$ into $\textcircled{2}$

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

$$-8 + 2y = 2$$

$$2y = 2 + 8$$

$$\frac{2y}{2} = \frac{10}{2}$$

$$y = 5$$

\therefore The P.O.I. is (-2, 5)

b)

$$\begin{aligned} \textcircled{1} & 5x + 2y = 11 \\ \textcircled{2} & 3x - 3y = 15 \end{aligned}$$

$$3 \times \textcircled{1} = \textcircled{3} \quad 15x + 6y = 33$$

$$5 \times \textcircled{2} = \textcircled{4} \quad 15x - 15y = 75$$

$$\textcircled{3} - \textcircled{4}$$

$$\frac{21y}{21} = \frac{-42}{21}$$

$$\textcircled{5} y = -2$$

Sub $\textcircled{5}$ into $\textcircled{1}$

$$5x + 2(-2) = 11$$

$$5x - 4 = 11$$

$$5x = 11 + 4$$

$$\frac{5x}{5} = \frac{15}{5}$$

$$x = 3$$

\therefore The P.O.I. is (3, -2)

4. Janice is considering two long distance phone lines to use in college.
 Phone Friend Inc. charges a flat fee of \$25 plus \$0.05/minute of long distance.
 Dial-a-Dime charges a flat rate fee of \$15 plus \$0.10/minute.

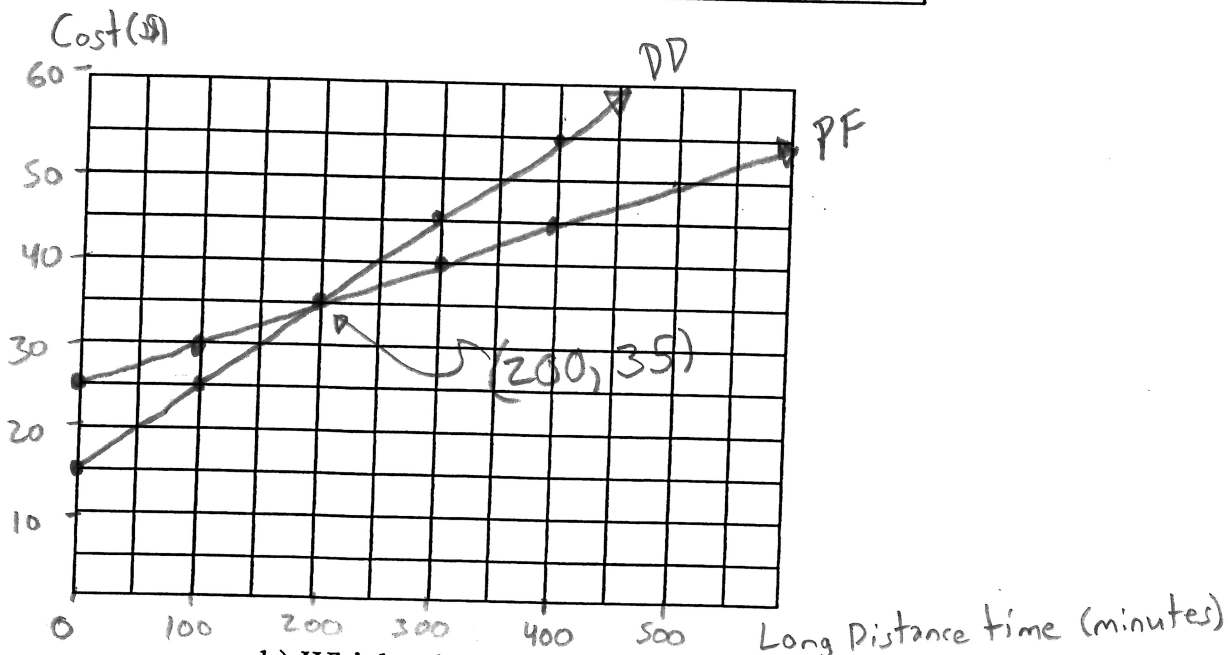
If 'C' represents the monthly cost and 'n' represents the number of minutes of long distance phone calls then the two scenarios can be modeled by the equations:

Phone Friend Inc. : $C = 0.05n + 25$

Dial-a-Dime: $C = 0.10n + 15$

a) Complete the table and graph the two relationships.

Long Distance Time (minutes)	PhoneFriend Inc Cost (\$)	Dial-a-Dime Inc Cost (\$)
0	25	15
100	30	25
200	35	35
300	40	45
400	45	55



b) Which telephone company should Janice choose?

IF n is less than 200, choose D.D.
 IF n is greater than 200, choose P.F.
 IF n is equal to 200, choose either.

5. Vanier Vehicles makes cars and motorcycles; a car has four wheels and a motorcycle has two wheels. A retailer orders 100 vehicles from Vanier Vehicles. Vanier vehicles knows that they will be using 330 wheels to complete the order. The owner loses the original vehicle order and needs to figure out how many of each vehicle to make.

He first defines two variables:
 Let M represent the number of motorcycles ordered.
 Let C represent the number of cars ordered.

Then he creates two equations:
 $M + C = 100$
 $2M + 4C = 330$

Explain what each equation means and then determine how many motorcycles and cars were ordered?

① $M + C = 100$
 ② $2M + 4C = 330$
 Isolate M in ①
 ③ $M = (100 - C)$ new ①
 Sub ③ into ②
 $2(100 - C) + 4C = 330$

$200 - 2C + 4C = 330$
 $200 + 2C = 330$
 $2C = 330 - 200$
 $\frac{2C}{2} = \frac{130}{2}$
 ④ $C = 65$
 Sub ④ into ③

$M = 100 - (65)$
 $M = 35$
 \therefore There were 35 motorcycles and 65 cars.

6. Raj purchases two drinks and three hamburgers for a total cost of \$11.25.
 Roland purchases three drinks and one hamburger for a total cost of \$7.25.
 Make two equations and use them to determine the cost of one drink and one hamburger. Don't forget to include 'let' statements.

Let d represent the cost of one drink.
 Let h represent the cost of one hamburger.

① $2d + 3h = 11.25$
 ② $3d + h = 7.25$
 Isolate h in ②
 ③ $h = (7.25 - 3d)$ new ②

Sub ③ into ①
 $2d + 3(7.25 - 3d) = 11.25$
 $2d + 21.75 - 9d = 11.25$
 $-7d = 11.25 - 21.75$
 $\frac{-7d}{-7} = \frac{-10.5}{-7}$
 ④ $d = 1.5$
 Sub ④ into ③
 $h = 7.25 - 3(1.5)$
 $h = 7.25 - 4.5$
 $h = 2.75$
 \therefore One drink costs \$1.50 and one hamburger costs \$2.75.

Answers: 1a) (-3, 1) 1b) (2, -1) 2a) (2,4) 2b) (1,3) 3a) (-2,5) 3b) (3,-2) 4a) POI is (200,35) 4b) if $n < 200$; choose DD, if $n > 200$; choose PF, if $n = 200$ choose either.
 5) The order comprised of 35 motorcycles and 65 cars.
 6) hamburgers cost \$2.75 and drinks cost \$1.50