

**Math 10-C Systems of Equations Assignment List**

Name:

KEY

**C1 Solving a System Graphically**

- C1 Assignment - Solving Systems of Equations Graphically

**C2 Number of Solutions to a System**

- C2 Assignment - # of Solutions to a System

**C1-C2 Quiz**

**C3: Model a Situation**

- C3 Assignment - Model a Situation

**C4: Solving Algebraically (Substitution)**

- Text pg. 193: 1adf, 2-11

**C5: Solving Algebraically (Elimination)**

- Text pg. 197: 1bce, 4b, 6-14

**C3-C5 Quiz**

**Unit Review**

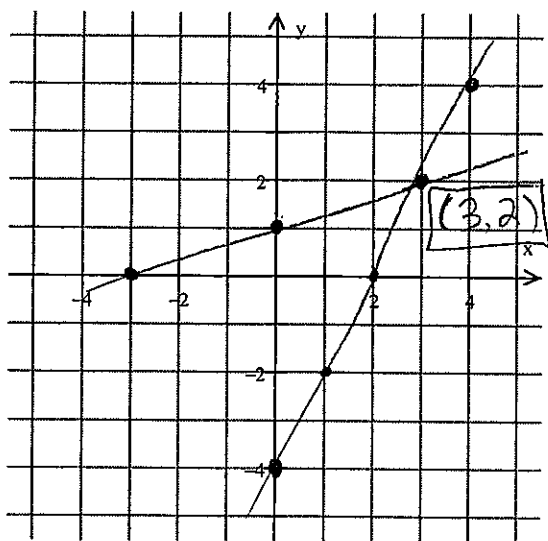
- Text pg. 212: 1-21, 23-26
- Problem Solving Practice Handout

# Solving Systems of Equations Graphically

Name: KEY

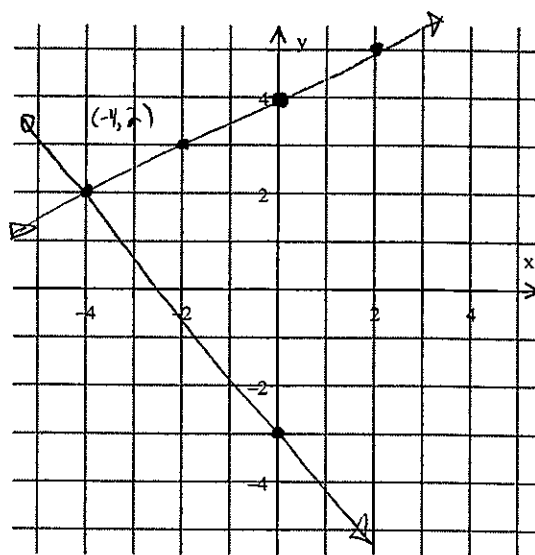
For each question, graph both equations on the same grid and locate the intersection point.

1.  $y = \frac{1}{3}x + 1$  ;  $y = 2x - 4$   $(3, 2)$

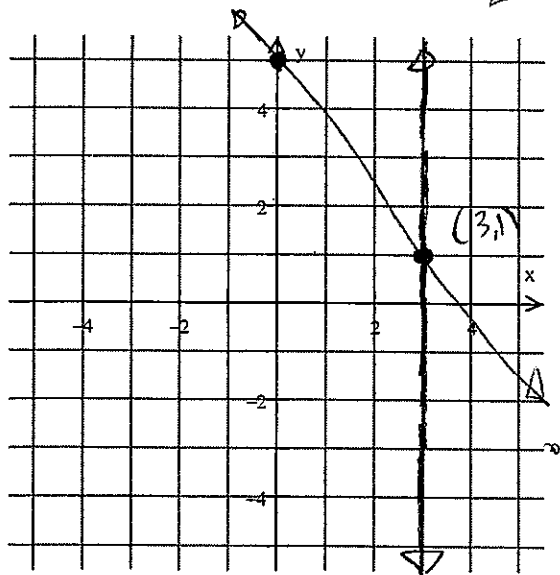


2.  $y = \frac{1}{2}x + 4$  ;  $5x + 4y + 12 = 0$   $(-4, 2)$

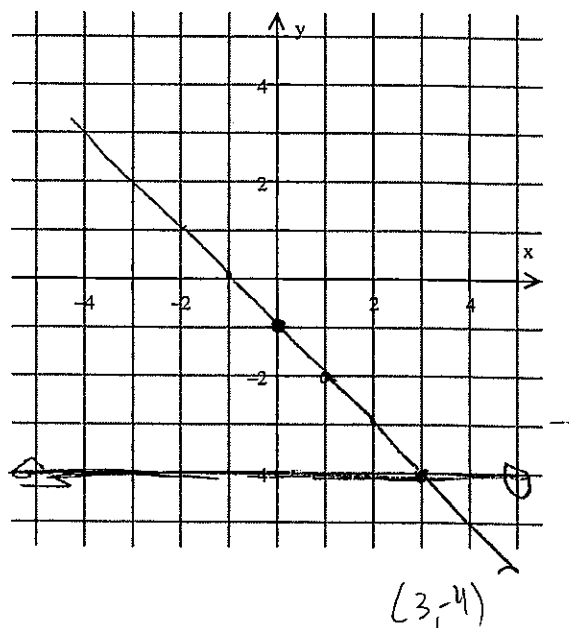
$\frac{1}{4}y = -5x - 12$   
 $y = -\frac{5}{4}x - 3$



3.  $y = -\frac{4}{3}x + 5$  ;  $x = 3$   $(3, 1)$



4.  $y = -x - 1$  ;  $y = -4$   $(3, -4)$



### Rich Problem: Choose a Wage Type (SOLUTION)

Declare variables:

$w$  = weekly wage

$h$  = hours worked in a week

Equations:

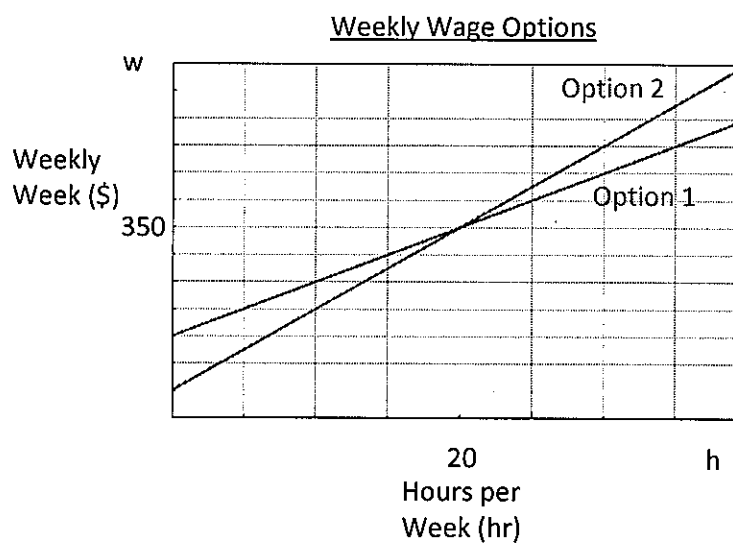
Option 1:  $w = 10h + 150$

Option 2:  $w = 15h + 50$

Which Option is Better?

Analyze with a Graph / Table of Values

$h$	$w$ (Option 1)	$w$ (Option 2)
0	\$150	\$50
10	\$250	\$200
20	\$350	\$350
30	\$450	\$500
40	\$550	\$650



Both options make the same amount if you work 20 hours. If you work less than 20 hours a week you should choose Option 1 but if you work more than 20 hours a week you should choose Option 2.

# Systems of Linear Equations

## C2 Assignment - Number of Solutions to a System

Name: KEY

1. Predict the number of solutions for each system of linear equations. Justify your answers.

a)  $y = 4x - 1$   
 $y = 4x + 7$

$m =$

$\therefore$  no solution

$b \neq$

b)  $y = 3x + 5$   
 $y = -3x + 5$

$m \neq$

$\therefore$  one solution

c)  $x + 2y = 7$   
 $5x + 10y = 35$

$x + 2y \Rightarrow$   
 $2y = -x + 7$   
 $y = -\frac{1}{2}x + \frac{7}{2}$

$5x + 10y = 35$   
 $10y = -5x + 35$   
 $y = -\frac{1}{2}x + \frac{7}{2}$

$m =$   
 $b =$

$\infty$  solutions

d)  $2x - y + 3 = 0$   
 $2x - y - 7 = 0$

$y = 2x + 3$   
 $y = 2x - 7$

$m =$   
 $b \neq$

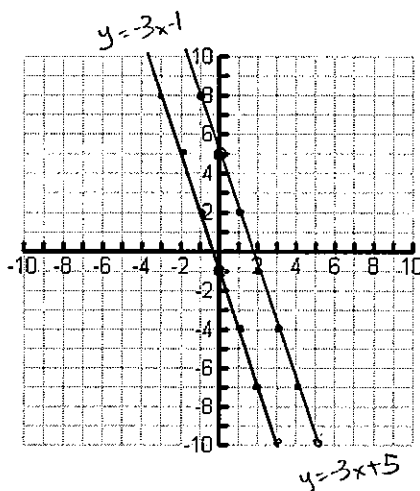
$\therefore$  no solutions

2. Graph each system of linear equations and indicate the number of solutions.

a)  $6x + 2y = 10$   
 $y = -3x - 1$

$6x + 2y = 10$   
 $2y = -6x + 10$

$y = -3x + 5$

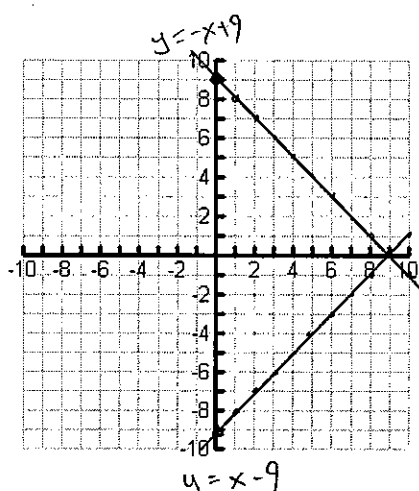


$m =$   
 $b \neq$

$\therefore$  no solution

b)  $x + y = 9$   
 $x - y = 9$

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



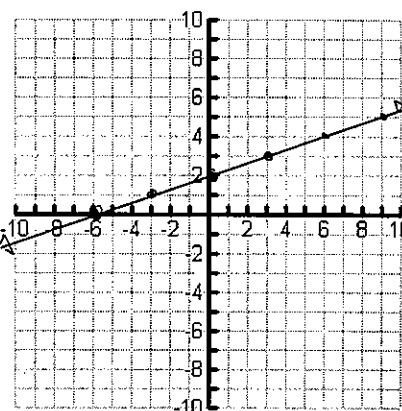
$m \neq$

$\therefore$  one solution

c)  $3y = x + 6$   
 $6y - 2x = 12$

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

$6y = 2x + 12$   
 $y = \frac{1}{3}x + 2$



$m =$   
 $b =$

$\therefore \infty$  solutions

3. A line is defined by the equation  $y = \frac{3}{2}x - 4$ . Determine the equation of a second line such that the system of linear equations has...

a) no solution

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

b) an infinite number of solutions

$$y = \frac{3}{2}x - 4$$

Answers may vary.

c) one solution

$$y = x$$

4. Service charges of two cell phone companies consist of a constant flat rate and a rate per minute of use. If  $C$  represent the total cost and  $m$  represents the rate per minute, use values of your choice to create a system of linear equations that expresses the service charges of the companies where the system has

a) one solution

$$\text{Company 1} \rightarrow C = 10m + 20$$

$$\text{Company 2} \rightarrow C = 15m + 12$$

b) no solution

$$\text{Company 1} \rightarrow C = 15m + 20$$

$$\text{Company 2} \rightarrow C = 15m + 12$$

Answers may vary.

c) an infinite number of solutions

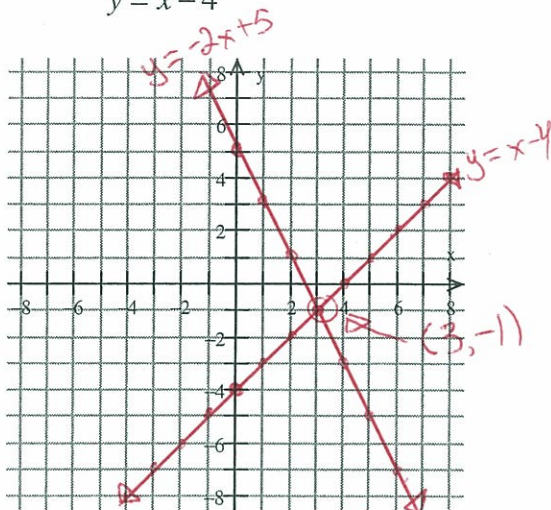
$$\text{Company 1} = \text{Company 2} \rightarrow C = 15m + 20$$

# M10C Systems of Equations - Quiz C1,C2

Name: KEY  
Date: \_\_\_\_\_

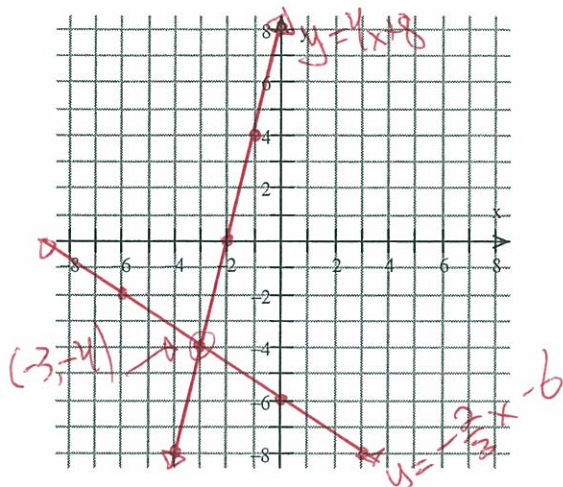
1. Solve each system of linear equations graphically.

a)  $y = -2x + 5$   
 $y = x - 4$



Solution =  $(3, -1)$

b)  $y = 4x + 8$   
 $2x + 3y = -18$



Solution =  $(-3, -4)$

2. Verify that the point (2,5) is a solution to the following system of linear equations? Show all work.

$x + 4y = 22$   
 $3x - y = 2$

(2,5) is NOT  
a solution.

$x + 4y = 22$   
 $(2) + 4(5) = 22$   
 $2 + 20 = 22$   
 $22 = 22$   
 $LS = RS \checkmark$

$3x - y = 2$   
 $3(2) - (5) = 2$   
 $6 - 5 = 2$   
 $1 = 2$   
 $LS \neq RS \times$

3. Predict the number of solutions for each system of linear equations. Justify your answers.

a)  $y = -\frac{1}{2}x + 2$   
 $y = -\frac{1}{2}x + 4$

$m =$   
 $b \neq$  → No Solution

b)  $6y - 4x = 6$  →  $\frac{6y}{6} = \frac{4x+6}{6}$   
 $y = \frac{2}{3}x + 1$

$m =$   
 $b =$  → Infinite # of Solutions

# C3 Assignment - Model a Situation

KEY

1. a)  $V =$  volume of fuel in tank (L)  
 $t =$  time (s)

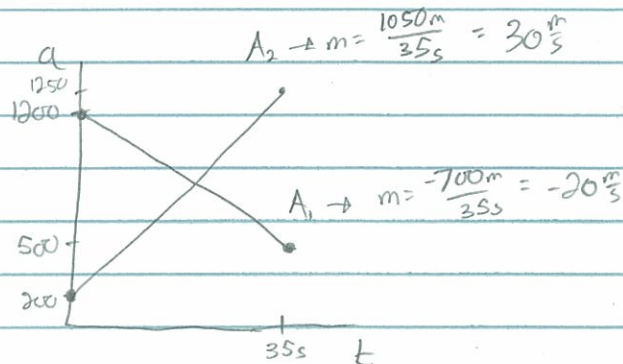
Vehicle #1  $\rightarrow V = 0.9t + 5$

Vehicle #2  $\rightarrow V = 1.2t + 3$

- b)  $a =$  altitude (m)  
 $t =$  time (s)

Airplane #1  $\rightarrow a = -20t + 1200$

Airplane #2  $\rightarrow a = 30t + 200$



- c)  $C =$  cost (\$)   
 $n =$  number of guests

Restaurant #1  $\rightarrow C = 20n + 175$

Restaurant #2  $\rightarrow C = 22.50n + 100$

- d)  $x =$  amount invested in long-term account (\$)  
 $y =$  amount invested in short-term account (\$)

Total Invested  $\rightarrow x + y = 15\,000$

Total Interest  $\rightarrow 0.065x + 0.05y = 885$

- e)  $s =$  price of student ticket (\$)  
 $a =$  price of adult ticket (\$)

$$2s + 6a = 102$$

$$8s + 3a = 114$$



M10C Systems of Linear Equations  
Quiz C3-C6

/ 8

Name: KEY

Solve each system of equations using an algebraic method (Substitution or Elimination).

1.  $y = 3x - 1$   
 $x + y = 11$

$$\begin{aligned} y &= 3x - 1 \\ x + y &= 11 \\ x + (3x - 1) &= 11 \\ 4x - 1 &= 11 \\ 4x &= 12 \\ x &= 3 \\ y &= 3(3) - 1 \\ y &= 9 - 1 \\ y &= 8 \\ (3, 8) \end{aligned}$$

$$\begin{aligned} 2(7x - 6y &= 27) \rightarrow 14x - 12y = 54 \\ 2(2x + 9y &= -3) \rightarrow -14x + 63y = -21 \\ \hline -75y &= 75 \\ y &= -1 \end{aligned}$$

$$\begin{aligned} 2x + 9y &= -3 \\ 2x + 9(-1) &= -3 \\ 2x - 9 &= -3 \\ 2x &= 6 \\ x &= 3 \end{aligned}$$

$$(3, -1)$$



3. A 500-space parking lot is filled with motorcycles and passenger cars, with only one vehicle in each space. How many motorcycles and cars are there if the total number of tires on the parked vehicles is 1650?

$m = \# \text{ of motorcycles}$

$c = \# \text{ of cars}$

$\# \text{ vehicles} \rightarrow m + c = 500 \quad (1)$

$\# \text{ tires} \rightarrow 2m + 4c = 1650 \quad (2)$

$(1) \times 2 \rightarrow 2m + 2c = 1000$

$(2) \rightarrow -2m + 4c = 1650$

$-2c = -650$

$c = 325$

$m + c = 500$

$m + (325) = 500$

$m = 175$

There are 325 cars and 175 motorcycles.

4. A sports club charges an initiation fee and a monthly fee. At the end of 5 months, Christelle had paid a total of \$170. Her friend, Keaton, had paid \$295 at the end of 10 months. What is the initiation fee and what is the monthly fee?

$i = \text{initiation fee}$

$m = \text{monthly fee}$

Christelle  $\rightarrow 5m + i = 170$

Keaton  $\rightarrow -10m + i = 295$

$-5m = -125$

$m = \$25$

$5m + i = 170$

$5(25) + i = 170$

$125 + i = 170$

$i = \$45$

The initiation fee is \$45 and the monthly fee is \$25.

### Solutions - Problem Solving Practice

1. Easy 4U if he drives less than 520 km. Speed-E-Car if he drives more than 520 km.
2. Basketball - 72 minutes; Biking - 18 minutes
3. Bicycles - 20; Tricycles - 10
4. Bagel - \$1.75; Juice - \$1.25
5. Grapes - 121.875 g; Oranges - 203.125 g