

Name: Key

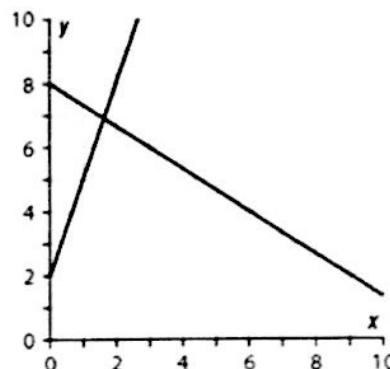
Quiz Review Systems of Linear Equations

Work on the following problems, showing your work. This review will be collected.
You must know how to graph equations WITHOUT a calculator!

1. At the right is the graph of the following system of equations:

$$\begin{cases} 4x + 6y = 48 \\ y = 3x + 2 \end{cases}$$

Madison looked at the graph and said that the solution to the system is (1.5, 7). Is Madison correct? Explain your reasoning OR show your work.



NO!

$$4(1.5) + 6(7) = 48$$

$$48 = 48$$

$$7 = 3(1.5) + 2$$

$$7 = 6.5 \quad \text{AH!}$$

2. With the help of your graphing calculator, graph each system below and determine if each system has exactly one solution (please state the solution), an infinite number of solutions, or no solution.

a. $12x + 18y = 36$
 $18y = 36 - 12x$

$8x + 12y = 24$
 $12y = 24 - 8x$

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

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

Number of Solutions:

infinitely many

b. $x + y = 10$

$y = 8 - x$

$\rightarrow y = 10 - x$

$\rightarrow y = (\text{not necessary})$

Number of Solutions:

No solution

Name: Keny

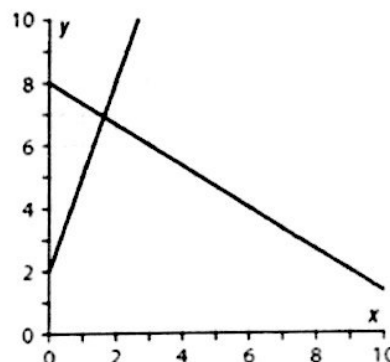
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a. $12x + 18y = 36$
 $18y = 36 - 12x$

$8x + 12y = 24$
 $12y = 24 - 8x$

$\rightarrow y = \underline{2 - 2/3x}$

$\rightarrow y = \underline{2 - 2/3x}$

Number of Solutions:

infinitely many

b. $x + y = 10$

$y = 8 - x$

$\rightarrow y = \underline{10 - x}$

$\rightarrow y = \text{(not necessary)}$

Number of Solutions:

NO solution

$$\begin{aligned} \text{c. } 9x + 3y &= 27 \\ 3y &= 27 - 9x \\ 3x - 9y &= 27 \\ -9y &= 27 - 3x \end{aligned}$$

$$\rightarrow y = \frac{9-3x}{3}$$

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

Number of Solutions:

One
solution
(3.6, -1.8)

3. Pat bought 16 pounds of nuts to serve at a party. Pat bought some peanuts (P) and some almonds (A). The total cost of the nuts was \$60. The peanuts cost \$3 per pound and the almonds cost \$5 per pound.

- a) Write two equations, one representing the total cost and the other the total amount of nuts purchased.

$$\begin{aligned} P + A &= 16 \\ 3P + 5A &= 60 \end{aligned}$$

- b) Choose the elimination or substitution method to solve the system and determine how many pounds of each nut Pat bought.

$$\begin{aligned} -3P - 3A &= -48 & \leftarrow \times -3 \\ 3P + 5A &= 60 \end{aligned}$$

$$2A = 12$$

$$A = 6$$

$$P + A = 16$$

$$P + 6 = 16$$

$$P = 10$$

- c) Write a sentence describing your answer. Check your solution.

Pat bought 10 lbs of peanuts +
6 lbs of almonds for \$60.

4. Depending on what method you used in #3, use a different method (elimination or substitution) to solve the following system of equations:

$$\begin{cases} x = -5 + y \\ 2x + 3y = 10 \end{cases}$$

Substitution: $2(-5 + y) + 3y = 10$

$$-10 + 2y + 3y = 10$$

$$-10 + 5y = 10$$

$$5y = 20$$

$$y = 4$$

$$x = -5 + 4 = -1$$

$$(-1, 4)$$

Elim: $x = -5 + y$

$$\begin{aligned} x - y &= -5 \xrightarrow{\times 3} 3x - 3y = -15 \\ 2x + 3y &= 10 \rightarrow 2x + 3y = 10 \end{aligned}$$

$$5x = -5$$

$$x = -1$$

$$x - y = -5$$

$$-1 - y = -5$$

$$-y = -4$$

$$y = 4$$

5. Find the solution to the following system of equations using the graphing method. you must show work!

$$\begin{cases} 30x + 24y = 60 & (1) \\ 20x + 16y = 40 & (2) \end{cases}$$

① $30x + 24y = 60$

$$24y = 60 - 30x \quad \div \text{ all by 24}$$

$$y = 2.5 - 1.25x$$

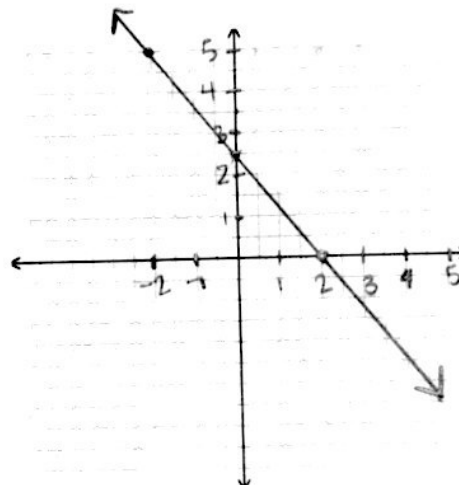
$$\text{or } y = 2.5 - \frac{5}{4}x$$

② $20x + 16y = 40$

$$16y = 40 - 20x \quad \div \text{ all by 16}$$

$$y = 2.5 - 1.25x$$

$$\text{or } y = 2.5 - \frac{5}{4}x$$



Same equation \rightarrow
INFINITELY MANY!

6. Solve the following systems of equations using your method of choice. If there is one solution, you MUST check that it satisfies the system!

a. $\begin{cases} 3x - 2y = 2 \\ 6x - 4y = 10 \end{cases}$

$$\begin{array}{r} -6x + 4y = -4 \\ 6x - 4y = 10 \\ \hline 0 = 6 \end{array}$$

NO
solution!

b. $\begin{cases} y = 1 - x \\ 2x - 5y = 16 \end{cases}$

$$2x - 5(1 - x) = 16$$

$$2x - 5 + 5x = 16$$

$$7x = 21$$

$$x = 3$$

$$y = -2$$

$$(3, -2)$$

✓:
 $-2 = 1 - 3$
 $-2 = -2$ ✓
 $2(3) - 5(-2) = 16$
 $6 + 10$
 $16 = 16$ ✓

7. Solve by Substitution

$$\begin{cases} x + 2y = 8 \rightarrow x = 8 - 2y \\ 4x + 2y = 8 \end{cases}$$

$$4(8 - 2y) + 2y = 8$$

$$32 - 8y + 2y = 8$$

$$\begin{array}{r} 32 - 6y = 8 \\ -32 \quad -32 \\ \hline -6y = -24 \end{array}$$

$$y = 4$$

$$x = 8 - 2(4) = 0$$

$$(0, 4)$$

✓:
 $0 + 2(4) = 8$
 $8 = 8$ ✓
 $4(0) + 2(4) = 8$
 $8 = 8$ ✓

8. Solve by Elimination

$$\begin{cases} (x - 3y = 6) \cdot 3 \rightarrow -3x + 9y = -18 \\ 3x - 9y = 18 \end{cases}$$

$$0 = 0$$

Infinitely
Many

9. Write a system of equations that has no solutions. Then explain how you know the system has no solutions.

(can be in " $y = mx + b$ ")

form \rightarrow must have
same slope (m)

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

$$y = -3x$$

$$y = \frac{1}{2}x + 11$$

$$y = -3x + 1$$

e+c.