

ALEKS® Systems and Rational Equations Quiz #1

Beginning and Intermediate Algebra Combined / MATH 101 - Fall 2014 – 504 (Prof. Miller)

Student Name/ID:

Instructor Note:

Directions: Every problem is worth two points. One point is for trying the problem and showing your work and one point is for getting the correct answer. There are an additional five points for demonstrating the study strategy that is posted on the board and talked about at the beginning of class.

1. Solve the following system of equations.

$$7x - 2y = -9$$

$$4x - 5y = -9$$

2. Two systems of equations are given below.

For each system, choose the best description of its solution.

If applicable, give the solution.

$\begin{aligned}x + 5y &= 5 \\ -x - 5y &= 5\end{aligned}$	<p><input type="radio"/> The system has no solution.</p> <p><input type="radio"/> The system has a unique solution:</p> <p>$(x, y) = (\square, \square)$</p> <p><input type="radio"/> The system has infinitely many solutions.</p> <p>They must satisfy the following equation:</p> <p>$y = \square$</p>
$\begin{aligned}x + 3y &= 3 \\ -x - 3y &= -3\end{aligned}$	<p><input type="radio"/> The system has no solution.</p> <p><input type="radio"/> The system has a unique solution:</p> <p>$(x, y) = (\square, \square)$</p> <p><input type="radio"/> The system has infinitely many solutions.</p> <p>They must satisfy the following equation:</p> <p>$y = \square$</p>

3. Use substitution to solve the system.

$$y = 3x - 4$$
$$4x + 3y = 27$$

$x = \boxed{}$

$y = \boxed{}$

4. The Nguyen family and the Green family each used their sprinklers last summer. The water output rate for the Nguyen family's sprinkler was 40 L per hour. The water output rate for the Green family's sprinkler was 25 L per hour. The families used their sprinklers for a combined total of 55 hours, resulting in a total water output of 1825 L. How long was each sprinkler used?

Nguyen family's sprinkler:

Green family's sprinkler:

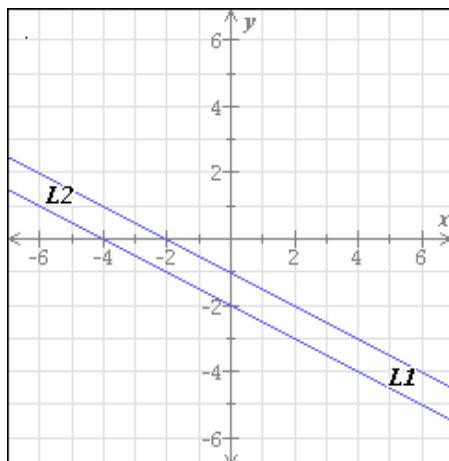
5. Solve the following system of equations.

$$3x - 5y = -1$$
$$-7x - 2y = 16$$

6. For each system of linear equations shown below, classify the system as "consistent dependent," "consistent independent," or "inconsistent." Then, answer the question about its solutions.

$$L1: y = \frac{-1}{2}x - 1$$

$$L2: y = \frac{-1}{2}x - 2$$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

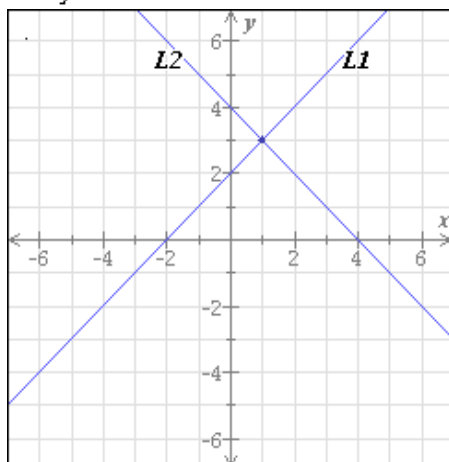
Solution: (,)

- no solution

- infinitely many solutions

$$L1: y = x + 2$$

$$L2: y = -x + 4$$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

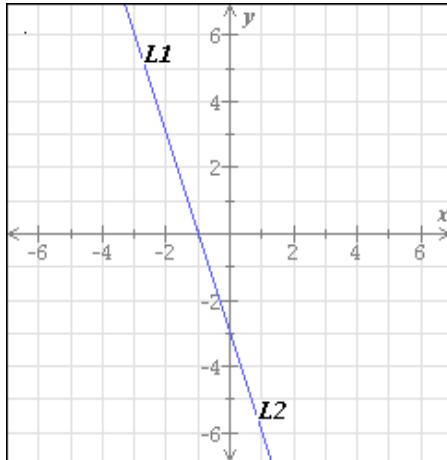
This means the system has:

- a unique solution:

Solution: (\quad, \quad) - no solution - infinitely many solutions

L1: $y = -3x - 3$

L2: $3x + y = -3$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

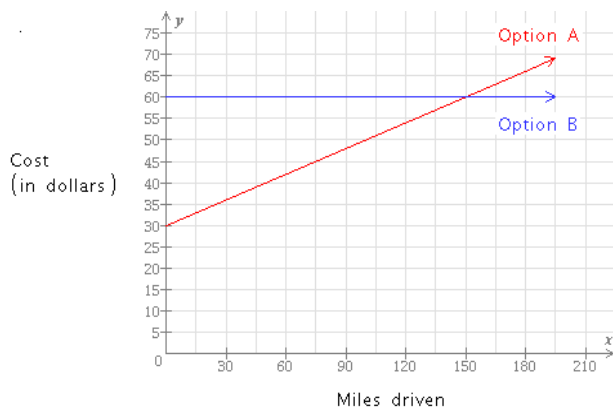
- a unique solution:

Solution: (\quad, \quad) - no solution - infinitely many solutions

7. Two systems of equations are given below.
For each system, choose the best description of its solution.
If applicable, give the solution.

$\begin{aligned} -x - 3y &= 6 \\ x + 3y &= 6 \end{aligned}$	<input type="radio"/> The system has no solution. <input type="radio"/> The system has a unique solution: $(x, y) = (\square, \square)$ <input type="radio"/> The system has infinitely many solutions. They must satisfy the following equation: $y = \square$
$\begin{aligned} x + 3y &= 9 \\ -x - 3y &= -9 \end{aligned}$	<input type="radio"/> The system has no solution. <input type="radio"/> The system has a unique solution: $(x, y) = (\square, \square)$ <input type="radio"/> The system has infinitely many solutions. They must satisfy the following equation: $y = \square$

8. Pablo will rent a car for a day. The rental company offers two pricing options: Option A and Option B. For each pricing option, cost (in dollars) depends on miles driven, as shown below.

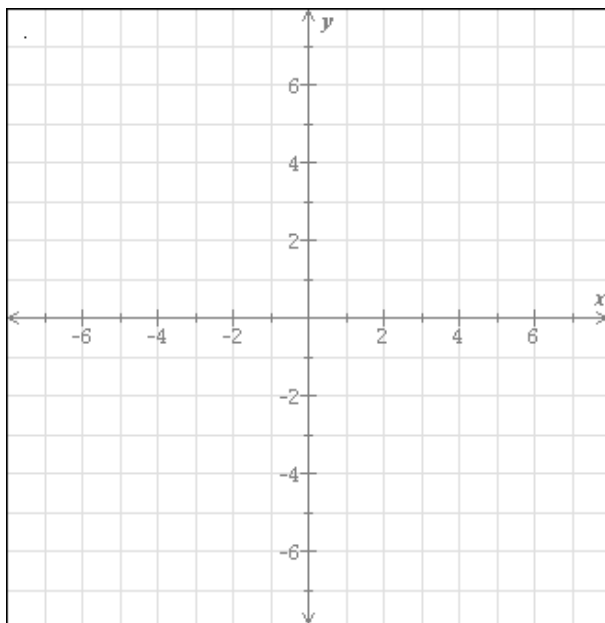


- If Pablo drives the rental car 75 miles, which option costs more? How much more does it cost than the other option?
- For what number of miles driven do the two options cost the same? If Pablo drives less than this amount, which option costs less?

9. Graph the system below and write its solution.

$$\begin{cases} 3x + y = -6 \\ y = \frac{1}{2}x + 1 \end{cases}$$

Note that you can also answer "No solution" or "Infinitely many" solutions.



10. Use substitution to solve the system.

$$5x + 4y = 5$$

$$x = 3y - 18$$

$$x = \boxed{}$$

$$y = \boxed{}$$

11. Solve for y

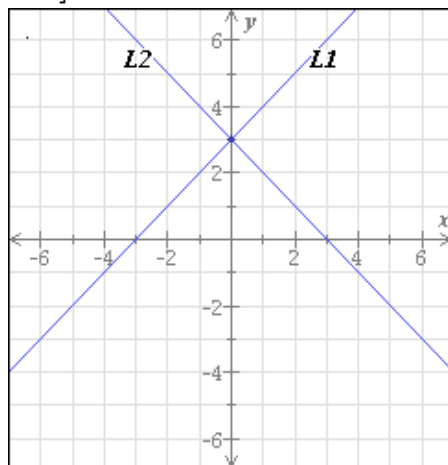
$$\frac{x}{y} = 5$$

12.

For each system of linear equations shown below, classify the system as "consistent dependent," "consistent independent," or "inconsistent." Then, answer the question about its solutions.

$$L1: y = x + 3$$

$$L2: y = -x + 3$$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

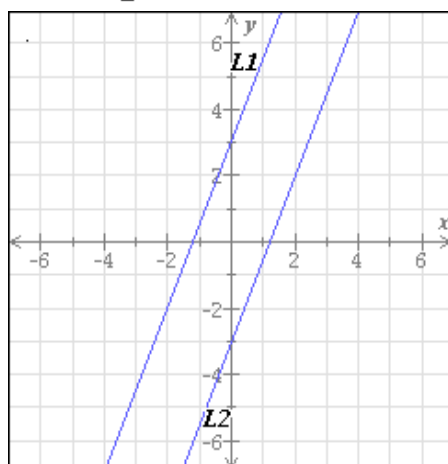
Solution: (,)

- no solution

- infinitely many solutions

$$L1: y = \frac{5}{2}x + 3$$

$$L2: y = \frac{5}{2}x - 3$$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

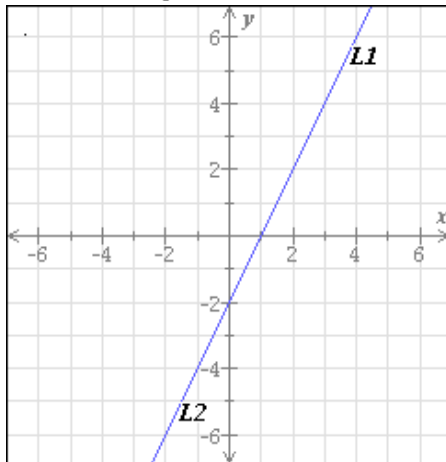
Solution: (\quad, \quad)

- no solution

- infinitely many solutions

L1: $y = 2x - 2$

L2: $-2x + y = -2$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

Solution: (\quad, \quad)

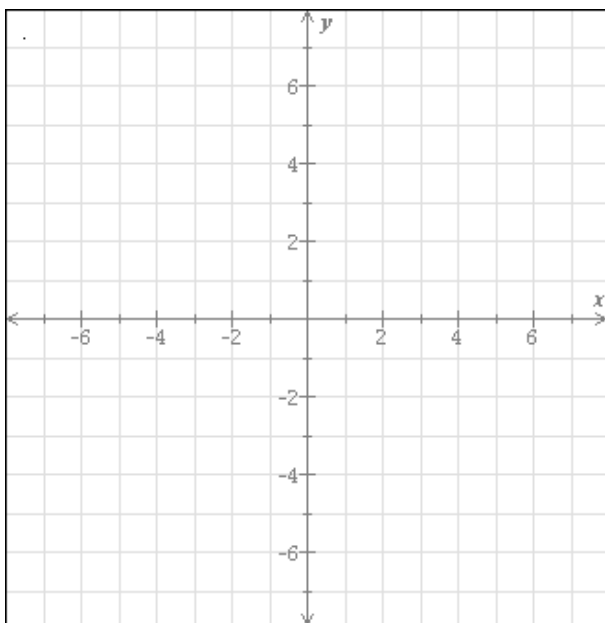
- no solution

- infinitely many solutions

13. Graph the system below and write its solution.

$$\begin{cases} y = -\frac{1}{2}x + 1 \\ -3x + y = -6 \end{cases}$$

Note that you can also answer "No solution" or "Infinitely many" solutions.



14. The sum of two numbers is 42 One number is 2 times as large as the other. What are the numbers?

15. Solve for m

$$a = \frac{F}{m}$$

Systems and Rational Equations Quiz #1 Answers for class Beginning and Intermediate Algebra Combined / MATH 101 - Fall 2014 – 504

1. $x = -1$
 $y = 1$

2. $\begin{aligned} x + 5y &= 5 \\ -x - 5y &= 5 \end{aligned}$	<input checked="" type="radio"/> The system has no solution. <input type="radio"/> The system has a unique solution: $(x, y) = (\square, \square)$ <input type="radio"/> The system has infinitely many solutions. They must satisfy the following equation: $y = \square$
$\begin{aligned} x + 3y &= 3 \\ -x - 3y &= -3 \end{aligned}$	<input type="radio"/> The system has no solution. <input type="radio"/> The system has a unique solution: $(x, y) = (\square, \square)$ <input checked="" type="radio"/> The system has infinitely many solutions. They must satisfy the following equation: $y = -\frac{x}{3} + 1$

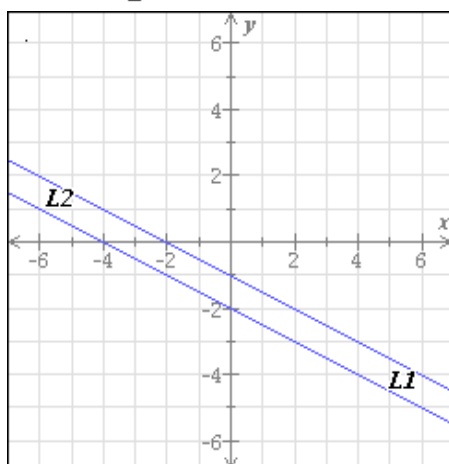
3. $x = 3$
 $y = 5$

4. Nguyen family's sprinkler: 30 hours
Green family's sprinkler: 25 hours

5. $x = -2$
 $y = -1$

6. L1: $y = \frac{-1}{2}x - 1$

L2: $y = \frac{-1}{2}x - 2$



This system of equations is:

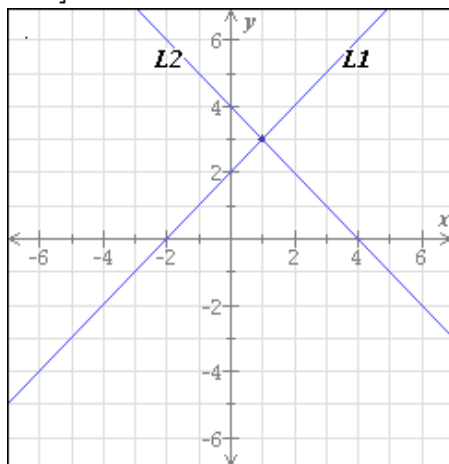
- inconsistent

This means the system has:

- no solution

L1: $y = x + 2$

L2: $y = -x + 4$



This system of equations is:

- consistent independent

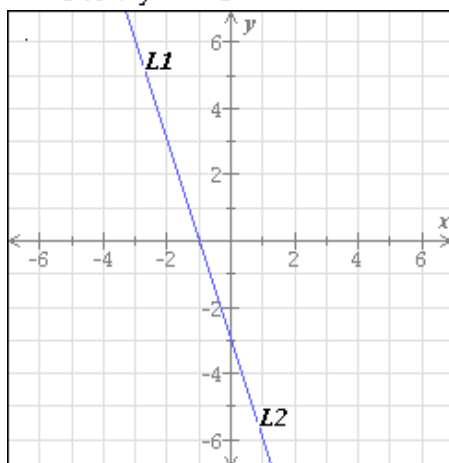
This means the system has:

- a unique solution:

Solution: $(1, 3)$

$$L1: y = -3x - 3$$

$$L2: 3x + y = -3$$



This system of equations is:

- consistent dependent

This means the system has:

- infinitely many solutions

<p>7.</p> $\begin{aligned} -x - 3y &= 6 \\ x + 3y &= 6 \end{aligned}$	<p><input checked="" type="radio"/> The system has no solution.</p> <p><input type="radio"/> The system has a unique solution:</p> $(x, y) = (\square, \square)$ <p><input type="radio"/> The system has infinitely many solutions.</p> <p>They must satisfy the following equation:</p> $y = \square$
$\begin{aligned} x + 3y &= 9 \\ -x - 3y &= -9 \end{aligned}$	<p><input type="radio"/> The system has no solution.</p> <p><input type="radio"/> The system has a unique solution:</p> $(x, y) = (\square, \square)$ <p><input checked="" type="radio"/> The system has infinitely many solutions.</p> <p>They must satisfy the following equation:</p> $y = -\frac{x}{3} + 3$

8.

(a) If Pablo drives the rental car 75 miles, which option costs more?

Option B

How much more does it cost than the other option?

\$15

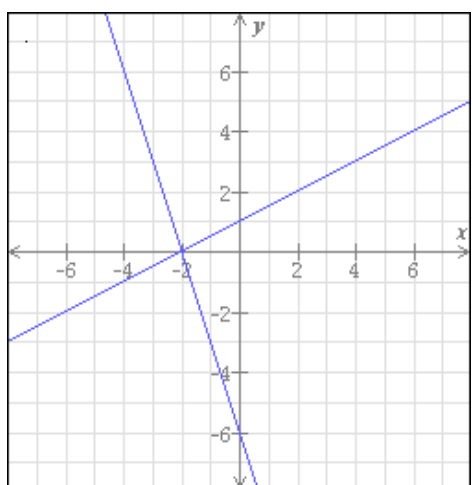
(b) For what number of miles driven do the two options cost the same?

150

If Pablo drives less than this amount, which option costs less?

Option A

9.



Solution: $(-2, 0)$

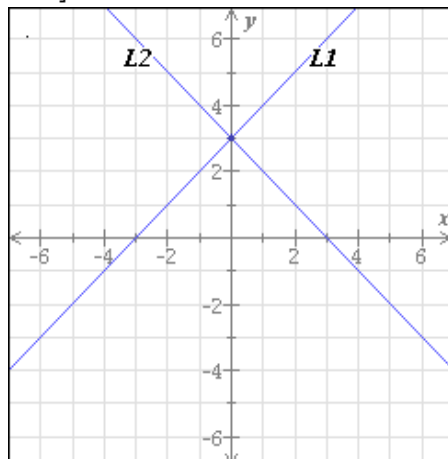
10. $x = -3$

$$y = 5$$

11. $y = \frac{x}{5}$

12. L1: $y = x + 3$

L2: $y = -x + 3$



This system of equations is:

- consistent independent

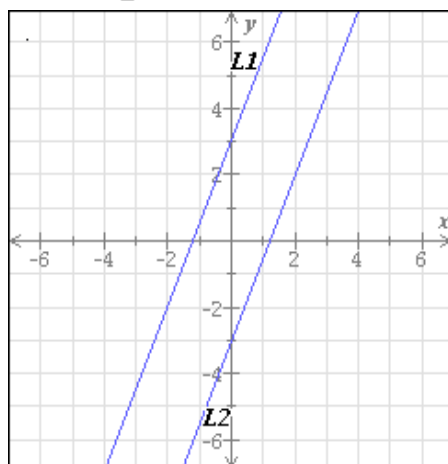
This means the system has:

- a unique solution:

Solution: $(0, 3)$

L1: $y = \frac{5}{2}x + 3$

L2: $y = \frac{5}{2}x - 3$



This system of equations is:

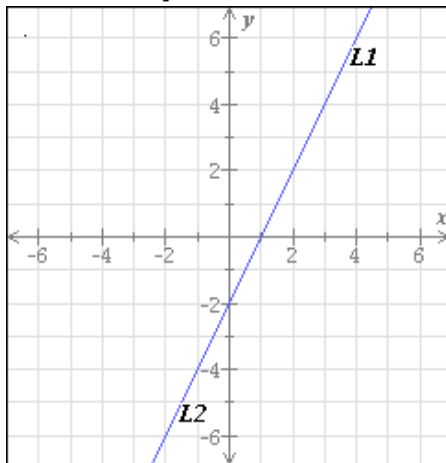
- inconsistent

This means the system has:

- no solution

$$L1: y = 2x - 2$$

$$L2: -2x + y = -2$$



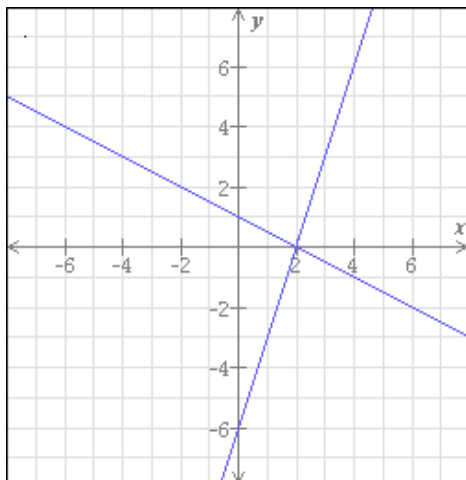
This system of equations is:

- consistent dependent

This means the system has:

- infinitely many solutions

13.



Solution: $(2, 0)$

14. Larger number: 28

Smaller number: 14

15.
$$m = \frac{F}{a}$$