

ALEKS® Lines, Functions, and Systems Quiz #1

Beginning and Intermediate Algebra Combined / MATH 102 - 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.

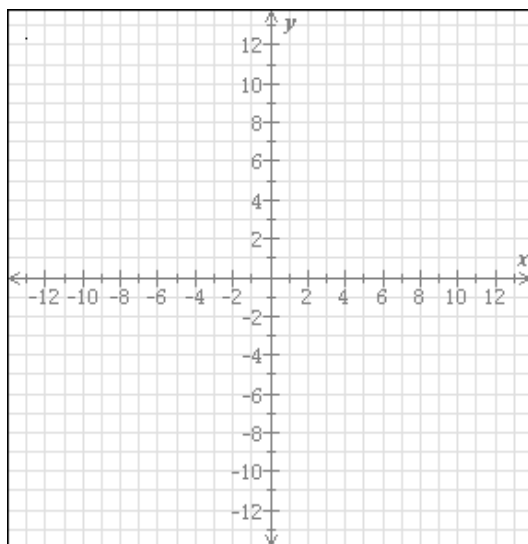
1. A scientist has two solutions, which she has labeled Solution A and Solution B. Each contains salt. She knows that Solution A is 70% salt and Solution B is 95% salt. She wants to obtain 110 ounces of a mixture that is 90% salt. How many ounces of each solution should she use?

Solution A:

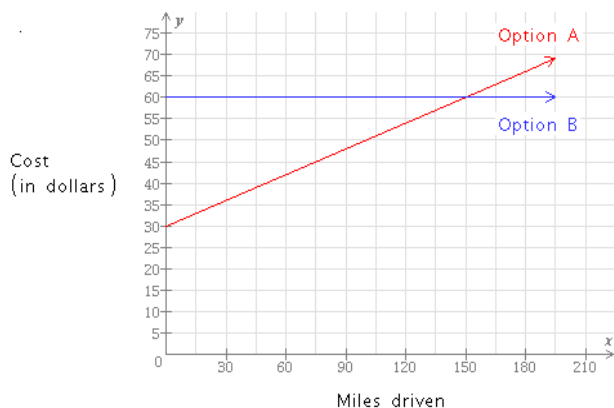
Solution B:

2. Graph the parabola.

$$y = -3x^2$$



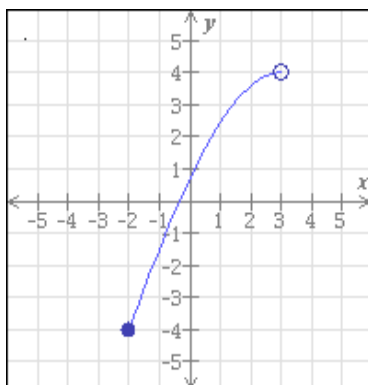
3. Pablo will rent a car for a day. The rental company offers two pricing options: Option A and Option B. For each pricing option, cost (in dollars) depends on miles driven, as shown below.



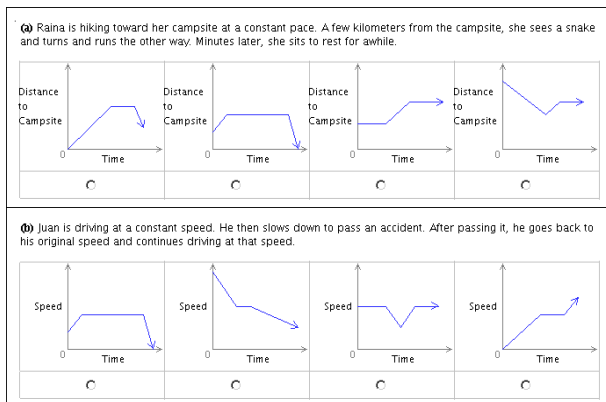
- If Pablo drives the rental car 75 miles, which option costs more? How much more does it cost than the other option?
- For what number of miles driven do the two options cost the same? If Pablo drives less than this amount, which option costs less?

4. The entire graph of the function h is shown in the figure below.

Write the domain and range of h using interval notation.

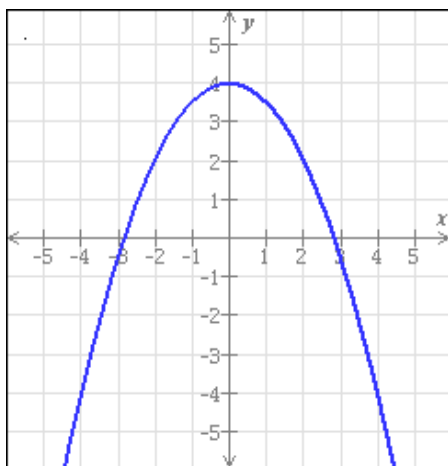


5. For each scenario below, choose the graph that gives the best representation.



6. The graph of a function f is shown below.

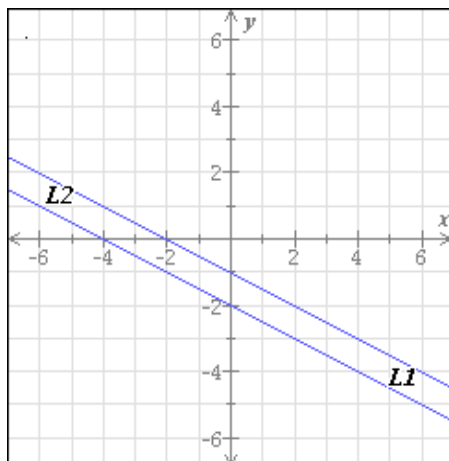
Find one value of x for which $f(x) = 4$ and find $f(-2)$



7. 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:

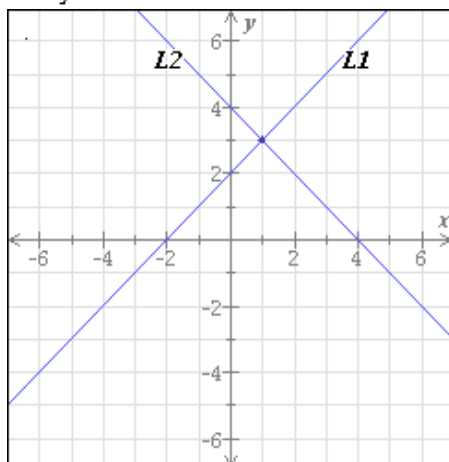
Solution: (,)

- 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:

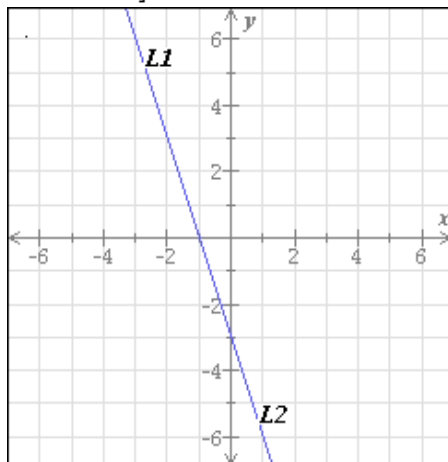
Solution: (\quad , \quad)

- 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

8. Hong bought a desktop computer and a laptop computer. Before finance charges, the laptop cost \$400 less than the desktop. He paid for the computers using two different financing plans. For the desktop the interest rate was 7.5% per year, and for the laptop it was 8% per year. The total finance charges for one year were \$371. How much did each computer cost before finance charges?

9. Solve the following system of equations.

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

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

10. 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:

11. The function g is defined by $g(x) = \frac{3x - 4}{x + 5}$

Find $g(x + 5)$

- 12.** 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: $(x, y) = (\square, \square)$</p> <p><input type="radio"/> The system has infinitely many solutions. They must satisfy the following equation: $y = \square$</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: $(x, y) = (\square, \square)$</p> <p><input type="radio"/> The system has infinitely many solutions. They must satisfy the following equation: $y = \square$</p>

- 13.** The functions f and g are defined as follows.

$$f(x) = -3x + 2 \qquad g(x) = 3x^3 + 5$$

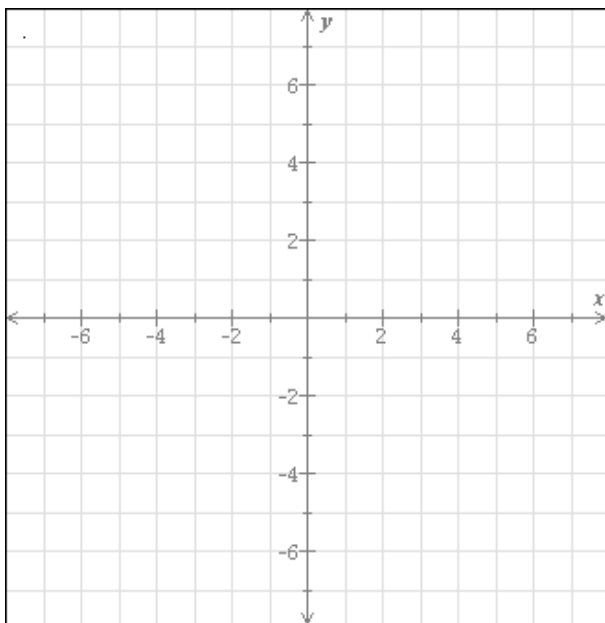
Find $f(3)$ and $g(-3)$

Simplify your answers as much as possible.

14. 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.



15. Use substitution to solve the system.

$$\begin{aligned} y &= 3x - 4 \\ 4x + 3y &= 27 \end{aligned}$$

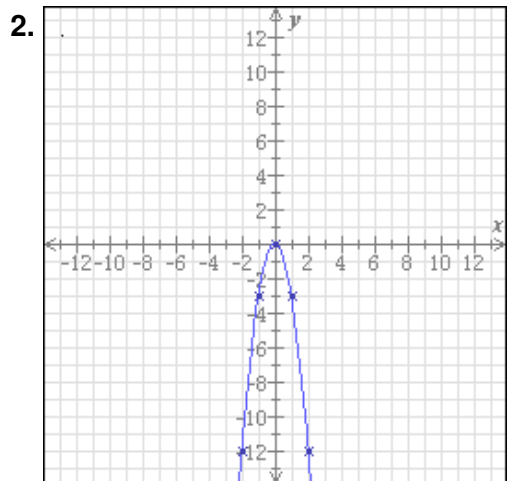
$$x = \boxed{}$$

$$y = \boxed{}$$

Lines, Functions, and Systems Quiz #1 Answers for class Beginning and Intermediate Algebra Combined / MATH 102 - Fall 2014 – 504

1. Solution A: 22 ounces

Solution B: 88 ounces



3. (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?

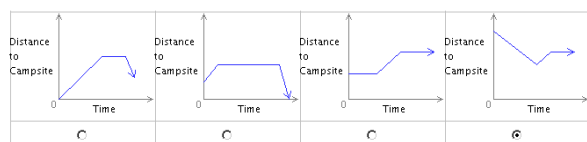
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If Pablo drives less than this amount, which option costs less?

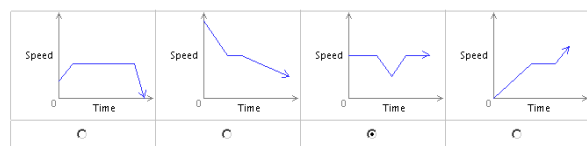
Option A

4. domain = $[-2, 3)$
range = $[-4, 4)$

5. Ⓐ Raina is hiking toward her campsite at a constant pace. A few kilometers from the campsite, she sees a snake and turns and runs the other way. Minutes later, she sits to rest for awhile.



- Ⓑ Juan is driving at a constant speed. He then slows down to pass an accident. After passing it, he goes back to his original speed and continues driving at that speed.

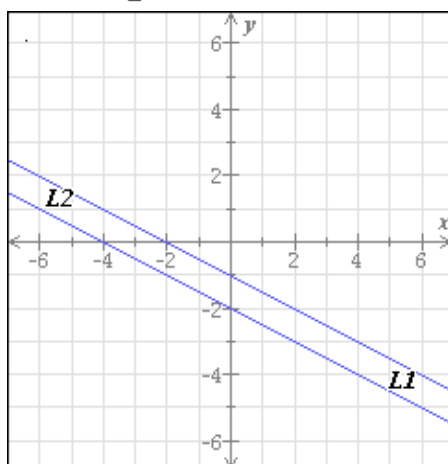


6. One value of x for which $f(x)=4$: 0

$$f(-2)=2$$

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

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



This system of equations is:

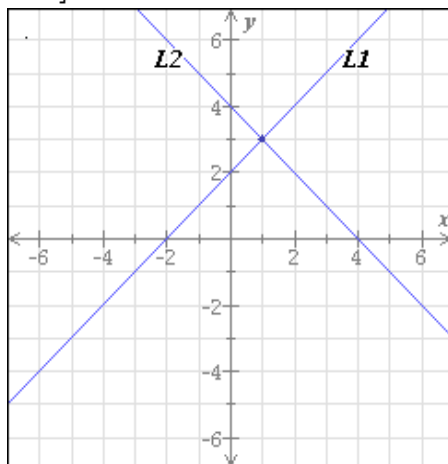
- inconsistent

This means the system has:

- no solution

L1: $y = x + 2$

L2: $y = -x + 4$



This system of equations is:

- consistent independent

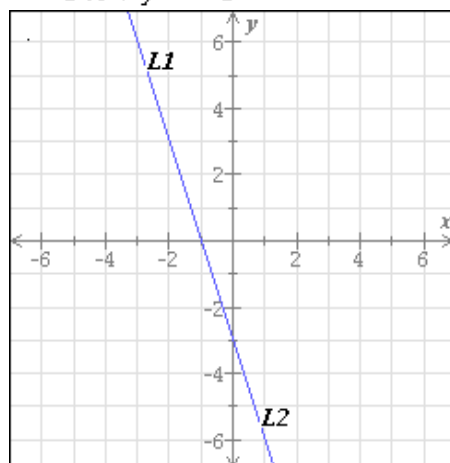
This means the system has:

- 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

8. Desktop: \$2600

Laptop: \$2200

9. $x = -1$

$y = 1$

10. Nguyen family's sprinkler: 30 hours

Green family's sprinkler: 25 hours

11. $g(x+5) = \frac{3x+11}{x+10}$

12.

$$\begin{aligned}x + 5y &= 5 \\ -x - 5y &= 5\end{aligned}$$

☒ The system has no solution.

☐ The system has a unique solution:

$$(x, y) = (\square, \square)$$

☐ The system has infinitely many solutions.
They must satisfy the following equation:

$$y = \square$$

$$\begin{aligned}x + 3y &= 3 \\ -x - 3y &= -3\end{aligned}$$

☐ The system has no solution.

☐ The system has a unique solution:

$$(x, y) = (\square, \square)$$

☒ The system has infinitely many solutions.
They must satisfy the following equation:

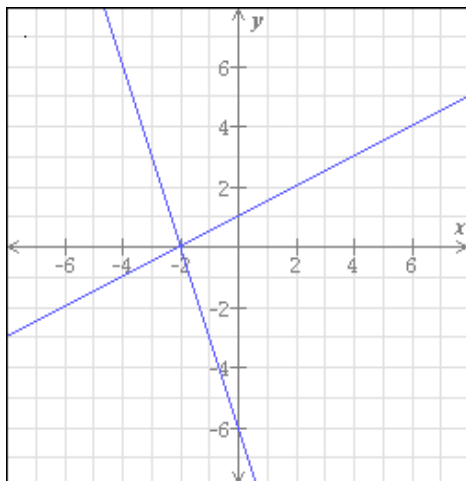
$$y = -\frac{x}{3} + 1$$

13.

$$f(3) = -7$$

$$g(-3) = -76$$

14.



Solution: $(-2, 0)$

15.

$$x = 3$$

$$y = 5$$