ALEKS® Math 102 Mock Final #2

Beginning and Intermediate Algebra Combined / MATH 102 - Fall 2014 – 504 (Prof. Miller)

Student Name/ID:

1. Fill in the table using this function rule.

$$y = -5x + 3$$

x	y
-2	
0	
2	
4	

2. A ball is thrown vertically upward. After t seconds, its height h (in feet) is given by the function $h(t) = 112t - 16t^2$ What is the maximum height that the ball will reach?

Do not round your answer.

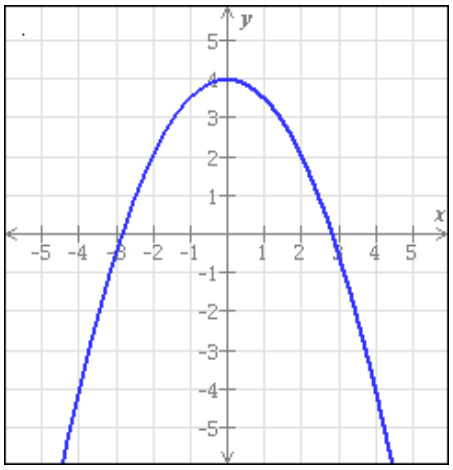
3. Solve the inequality for x

$$-\frac{5}{9}x - 2 \leq \frac{7}{6}x + \frac{4}{9}$$

Simplify your answer as much as possible.

4. Factor $25y^2+20y$

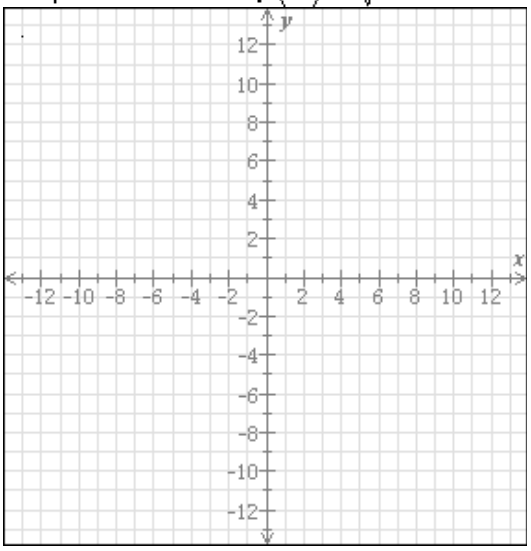
5. The graph of a function f is shown below.
Find one value of x for which $f(x)=4$ and find $f(-2)$



6. Order the expressions by choosing $>$ $<$ or $=$

$2^4\times2^2 \square 2^6$
$2^2\times4^2 \square 8^4$
$2^4\times4^2 \square 8^2$

7. Graph the function $f(x)=\sqrt{x+2}+7$



8. Simplify.

$$\left(-2wv^4\right)^5$$

Write your answer without parentheses.

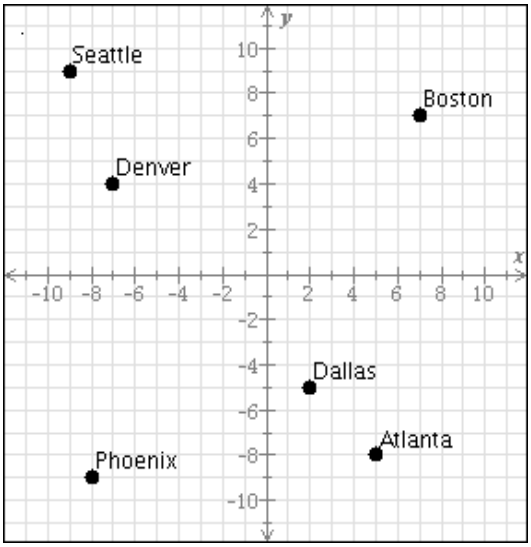
9. Write 0.00659 in scientific notation.

10. Multiply.

$$(v-3)(v+4)$$

Simplify your answer.

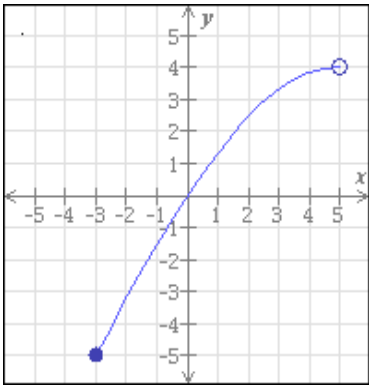
11. Give the location of Phoenix as an ordered pair (x, y)



12. Simplify.

$$\frac{b^7}{b^2}$$

13. The entire graph of the function g is shown in the figure below.
Write the domain and range of g using interval notation.



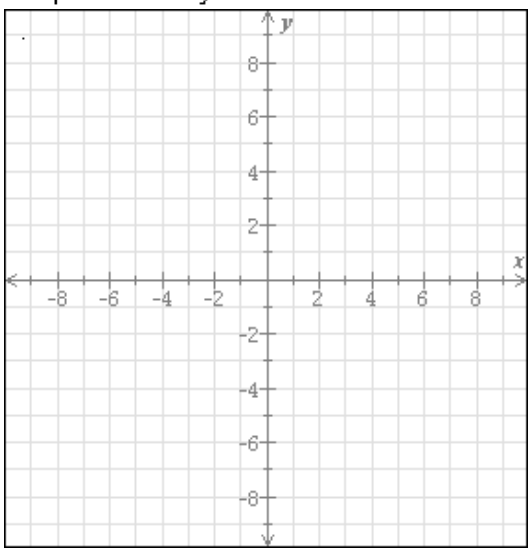
14. The sum of two numbers is 42 One number is 2 times as large as the other. What are the numbers?

15. Use substitution to solve the system.

$$5x+4y = 5$$
$$x = 3y-18$$

$x =$ ☐
$y =$ ☐

16. Graph the line $y = 3$



17. An airplane travels 4858 km against the wind in 7 hours and 5628 km with the wind in the same amount of time. What is the rate of the plane in still air and what is the rate of the wind?

Rate of the plane in still air: ☐ km/h
Rate of the wind: ☐ km/h

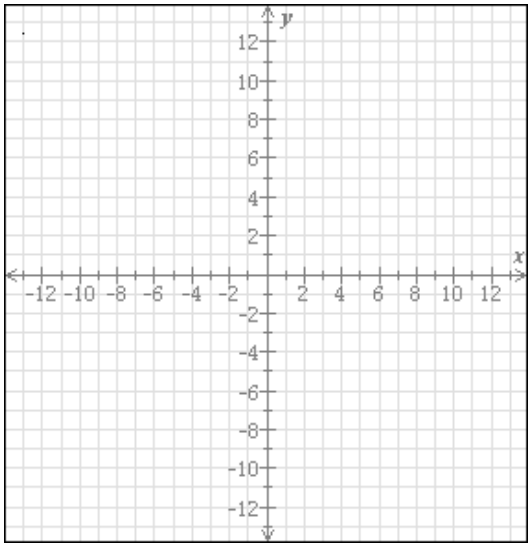
18. Find the greatest common factor of $15a^2$ and $12n$

19. Factor.

$y^2 + 7y - 18$

20. Graph the parabola.

$$y = 3x^2 + 12x + 5$$



21. The gas tank of a truck is a cylinder 5 ft long with a diameter of 2 ft At the gas station, a pump pours gas at the rate of $5\ \text{ft}^3$ per minute. How many minutes does it take to fill the empty tank with that pump?

Use the value 3.14 for π and round your answer to the nearest minute.

22. Find the least common multiple of $12w^3$ and $9y^4$

23. Multiply.

$$(z-6)(z+6)$$

Simplify your answer.

24. The area of a rectangle is $66\ \text{ft}^2$ and the length of the rectangle is $1\ \text{ft}$ more than twice the width. Find the dimensions of the rectangle.

25. Find the domain of the function.

$$g(x) = \sqrt{36 - 6x}$$

Write your answer using interval notation.

26. Simplify.

$$\left(\frac{3u^3v}{w^{-1}}\right)^{-3}\left(u^{-4}w^5\right)$$

Write your answer using only positive exponents.

27. Factor:

$$2x^2 - 7xy - 15y^2$$

28. Find the slope and the y-intercept of the line.

$$6x + 3y = -3$$

Write your answers in simplest form.

29. Write $5{,}659{,}000$ in scientific notation.

30. Solve for w

$$2w^2 - 13w + 37 = (w - 7)^2$$

If there is more than one solution, separate them with commas.

31. Simplify.

$$\sqrt{\frac{16}{25}}$$

Be sure to write your answer in simplest form.

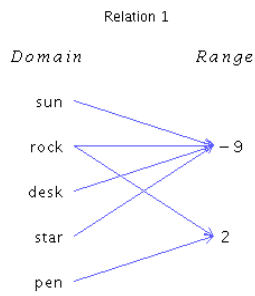
32. Divide.

$$\left(12u^6z^4 - 23u^6z^2\right) \div \left(-4u^4z^3\right)$$

Simplify your answer as much as possible.

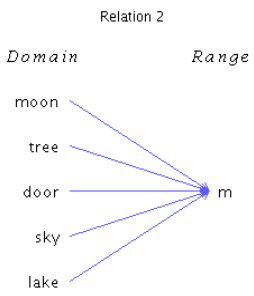
33. For each relation, decide whether or not it is a function.

Relation 1



○ Function
○ Not a Function

Relation 2



○ Function
○ Not a Function

Relation 3

$\{(2,-1),(-8,-1),(6,2),(-2,2)\}$

○ Function
○ Not a Function

Relation 4

$\{(r,y),(s,y),(m,y),(y,y)\}$

○ Function
○ Not a Function

34. Find the x-intercept(s) and the coordinates of the vertex for the parabola $y = x^2+4x-5$ If there is more than one x-intercept, separate them with commas.

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

$-x-3y=6$ $x+3y=6$	○ 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: $y = \square$
$x+3y=9$ $-x-3y=-9$	○ 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: $y = \square$

36. Solve for v

$$v^2+8v+12=0$$

37. Solve the following proportion for y

$$\frac{17}{7}=\frac{y}{5}$$

Round your answer to the nearest tenth.

38.
A line passes through the point $(8, 3)$ and has a slope of $\frac{5}{4}$

Write an equation in slope-intercept form for this line.

39. The cost C (in dollars) of manufacturing x radios at Jim's Stereo World is given by the function $C(x) = 0.4x^2 - 208x + 32{,}199$ What is the minimum cost of manufacturing radios?

Do not round your answer.

40. Factor.

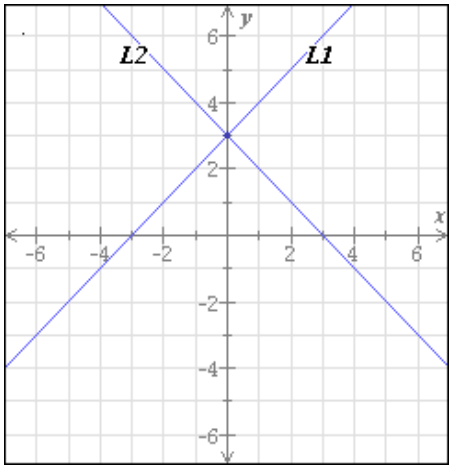
$$9y^2 - 18y - 7$$

41.

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:

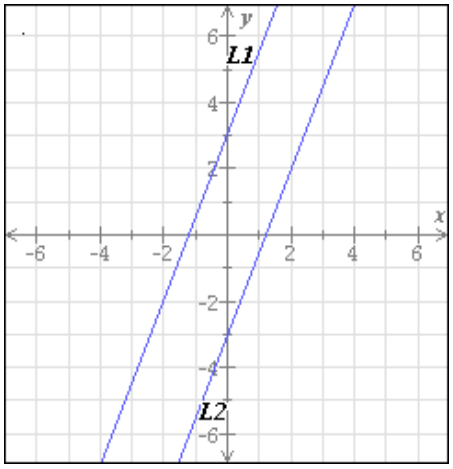
- consistent dependent - consistent independent - inconsistent

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:

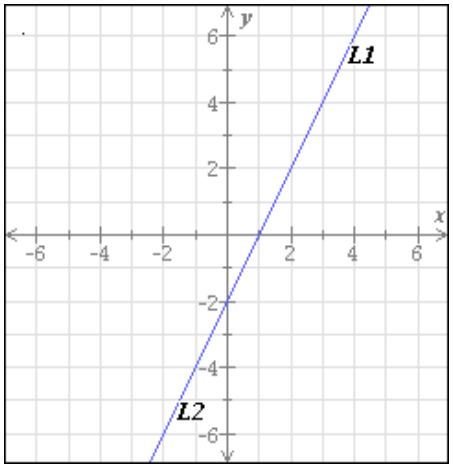
- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:
Solution: (,)
- 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: (,)
- no solution
- infinitely many solutions

42. Solve.

$$(4v-9)(8-v)=0$$

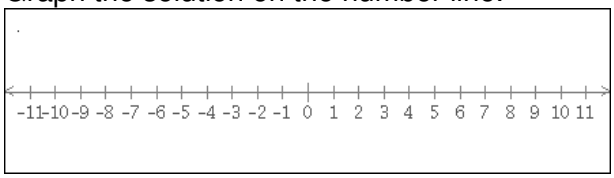
(If there is more than one solution, separate them with commas.)

43. Solve $(w+9)^2 - 45 = 0$ where w is a real number.
Simplify your answer as much as possible.

44. Solve the compound inequality.

$$-4 \leq 4x - 4 \leq 16$$

Graph the solution on the number line.



45. Suppose that the relation S is defined as follows.

$$S = \{ (-5, -5), (9, 9), (9, -3) \}$$

Give the domain and range of S
Write your answers using set notation.

46. Evaluate the expressions.

$$\left(\frac{4}{9}\right)^0 =$$

$$-(4)^0 =$$

47. Solve the following proportion for v

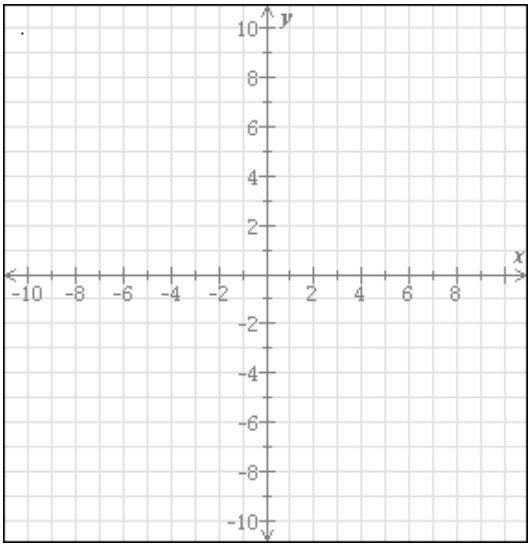
$$\frac{11}{3} = \frac{v}{10}$$

Round your answer to the nearest tenth.

48. Find the least common multiple of these two expressions.

$15v^7u^3$ and $10v^6u^8w^5$

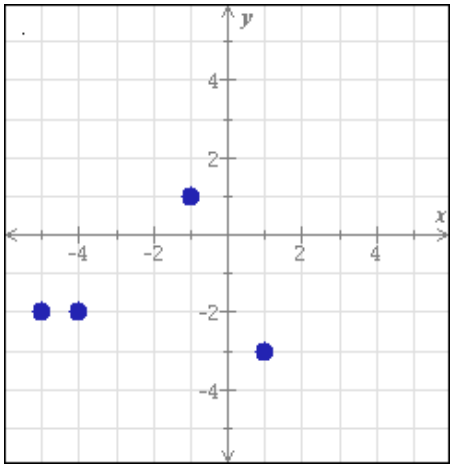
49. Graph the line whose x-intercept is -1 and whose y-intercept is 3



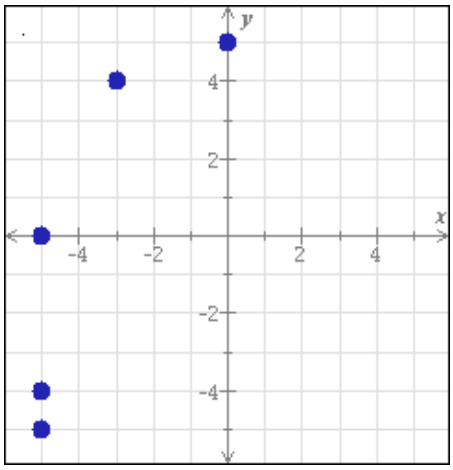
50. Use the quadratic formula to solve for x.

$$4x^2 - 9x + 3 = 0$$

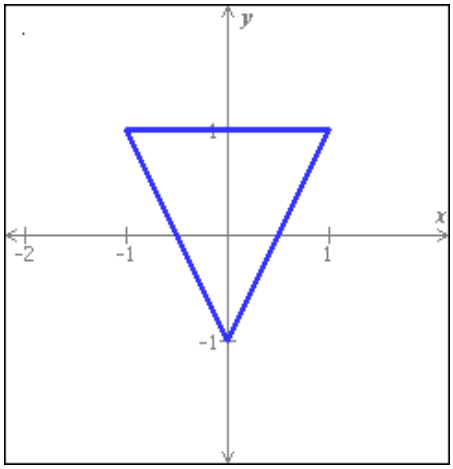
51. For each graph below, state whether it represents a function.



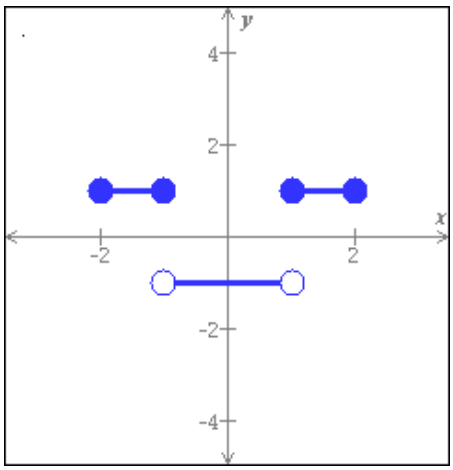
Function?:
Yes No



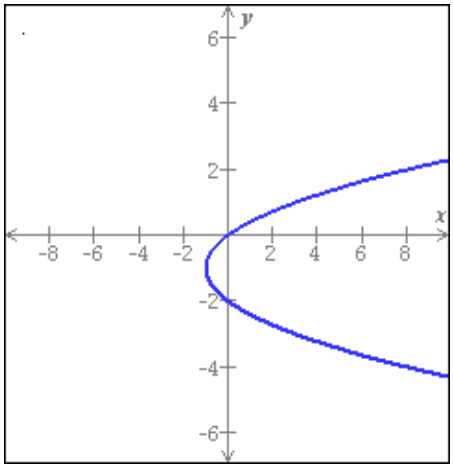
Function?:
Yes No



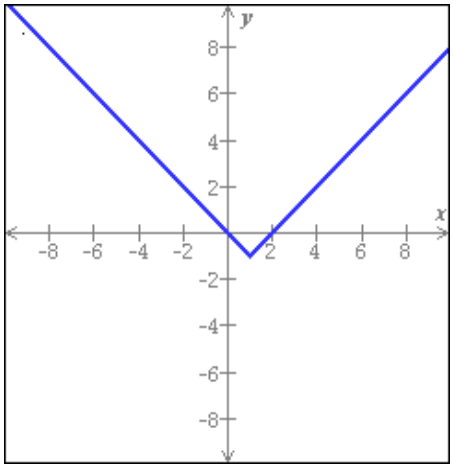
Function?:
Yes No



Function?:
Yes No



Function?:
Yes No



Function?:
Yes No

52. Write 0.000973 in scientific notation.

53. Use the quadratic formula to solve for x.

$$2x^2+5x-4=0$$

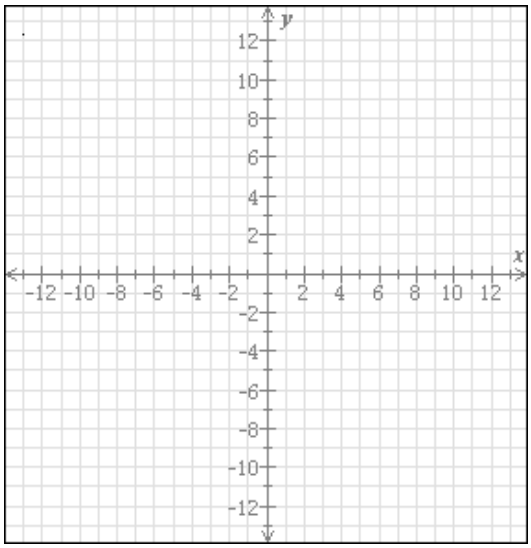
54. Use the distributive property to remove the parentheses.

$$10y^2\left(9-7y^4\right)$$

Simplify your answer as much as possible.

55. Graph the parabola.

$$y=3x^2$$



56. The sets D and E are defined as follows.

$$D = \{z \mid z \geq 4\}$$

$$E = \{z \mid z > 9\}$$

Write $D \cup E$ and $D \cap E$ using interval notation.
If the set is empty, write $\emptyset$

57. Give the degree of the polynomial.

$$-v^4 u^7 - 3x - 4 - 11 u^6 x^2 v^2$$

58. Find the least common multiple of these two expressions.

$4y^6 v^7 w^4$ and $10y^3 w^5$

59. Simplify.

$\sqrt{24}$

60. Simplify.

$\sqrt{45}$

Math 102 Mock Final #2 Answers for class Beginning and Intermediate Algebra Combined / MATH 102 - Fall 2014 – 504

1.

x	y
-2	13
0	3
2	-7
4	-17

2. Height: $196\,\text{ft}$

3. $x \geq -\frac{44}{31}$

4. $5y(5y+4)$

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

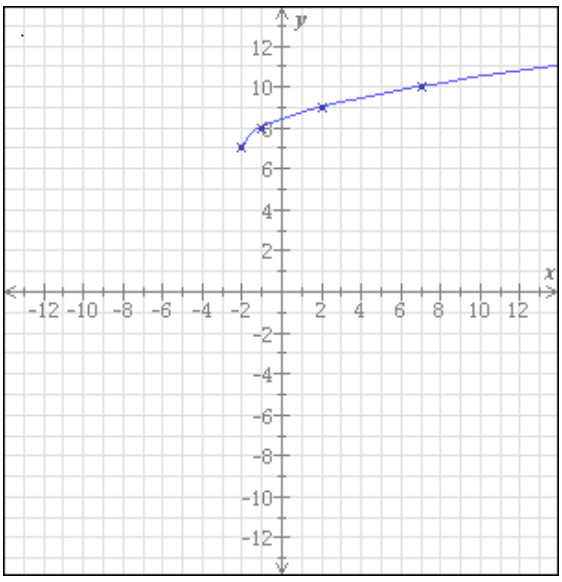
$f(-2)=2$

6. $2^4 \times 2^2 = 2^6$

$2^2 \times 4^2 < 8^4$

$2^4 \times 4^2 > 8^2$

7.



8. $-32w^5v^{20}$

9. 6.59×10^{-3}

10. $v^2 + v - 12$

11. $(x,y) = (-8,-9)$

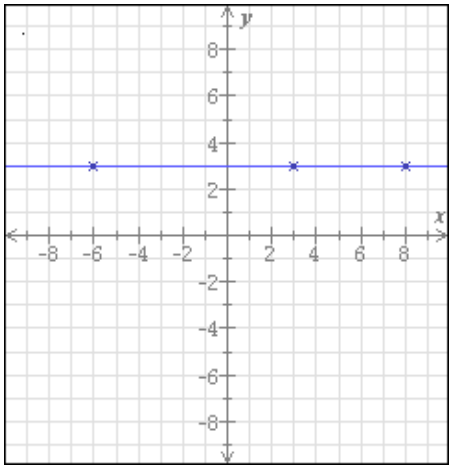
12. b^5

13. domain $= [-3, 5)$
range $= [-5, 4)$

14. Larger number: 28
Smaller number: 14

15. $x = -3$
$y = 5$

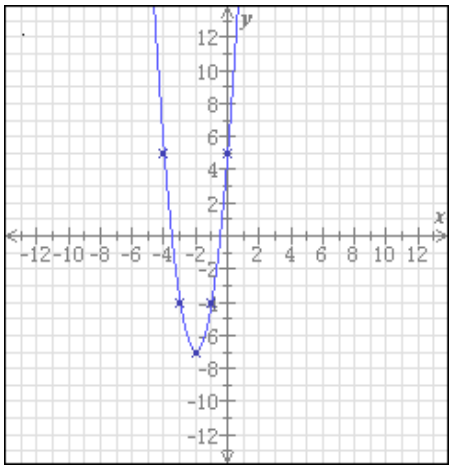
16.



17. Rate of the plane in still air: 749 km/h
Rate of the wind: 55 km/h

18. 3

19. $(y-2)(y+9)$

20. 

21. 3 minute(s)

22. $36w^3y^4$

23. z^2-36

24. Length: 12 ft

Width: 5.5 ft

25. $(-\infty,6]$

26. $\dfrac{w^2}{27u^{13}v^3}$

27. $(x-5y)(2x+3y)$

28. slope: -2

y-intercept: -1

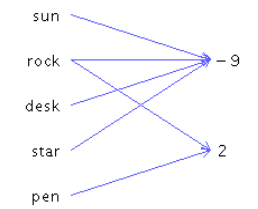
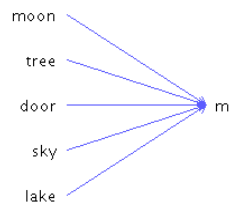
29. 5.659×10^6

30. $w=3,-4$

31. $\dfrac{4}{5}$

32. $-3u^2z+\dfrac{23u^2}{4z}$

33.

Relation 1	Relation 2
Domain / Range  ○ Function ◉ Not a Function	Domain / Range  ◉ Function ○ Not a Function
Relation 3 $\{(2,-1),(-8,-1),(6,2),(-2,2)\}$ ◉ Function ○ Not a Function	**Relation 4** $\{(r,y),(s,y),(m,y),(y,y)\}$ ◉ Function ○ Not a Function

34. x-intercept(s): -5 , 1

vertex: $(-2,\ -9)$

35.

$-x-3y=6$ $x+3y=6$	◉ The system has no solution. ○ The system has a unique solution: $(x,\ y) =$ (□, □) ○ The system has infinitely many solutions. They must satisfy the following equation: $y =$ □
$x+3y=9$ $-x-3y=-9$	○ The system has no solution. ○ The system has a unique solution: $(x,\ y) =$ (□, □) ◉ The system has infinitely many solutions. They must satisfy the following equation: $y = -\frac{x}{3}+3$

36. $v=-6\ \ -2$

37. $y=12.1$

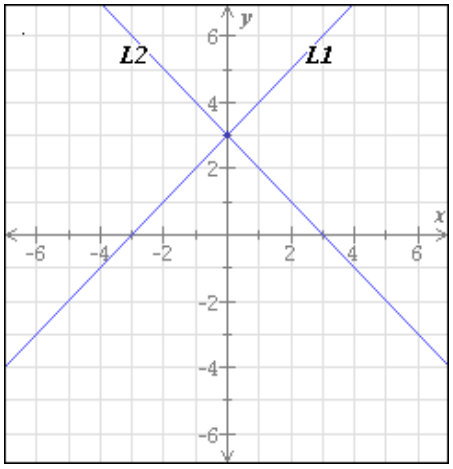
38. $y=\frac{5}{4}x-7$

39. Cost: $\$5159$

40. $(3y+1)(3y-7)$

41. L1: $y=x+3$

L2: $y=-x+3$



This system of equations is:

- consistent independent

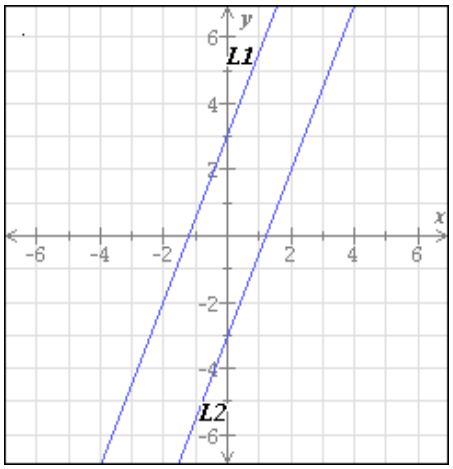
This means the system has:

- 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:

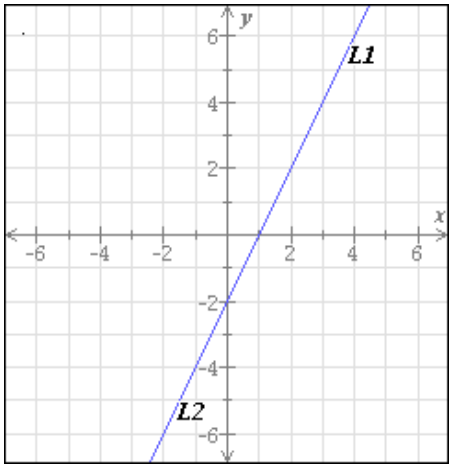
- inconsistent

This means the system has:

- no solution

L1: $y=2x-2$

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



This system of equations is:

- consistent dependent

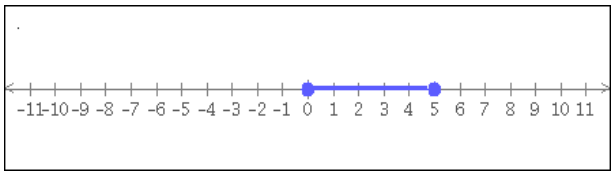
This means the system has:

- infinitely many solutions

42. $v=\frac{9}{4}, 8$

43. $w=-9+3\sqrt{5}, -9-3\sqrt{5}$

44.



45. domain $=\{-5, 9\}$

range $=\{-5, 9, -3\}$

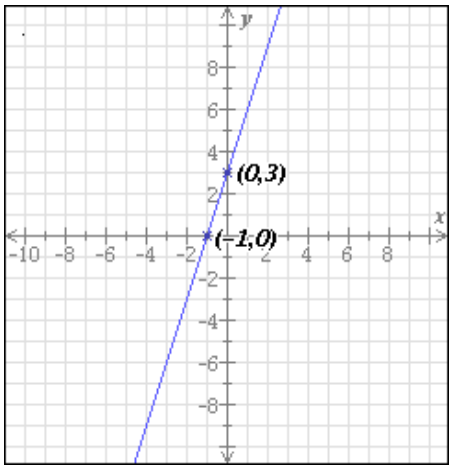
46. $\left(\frac{4}{9}\right)^0 = 1$

$-(4)^0 = -1$

47. $v=36.7$

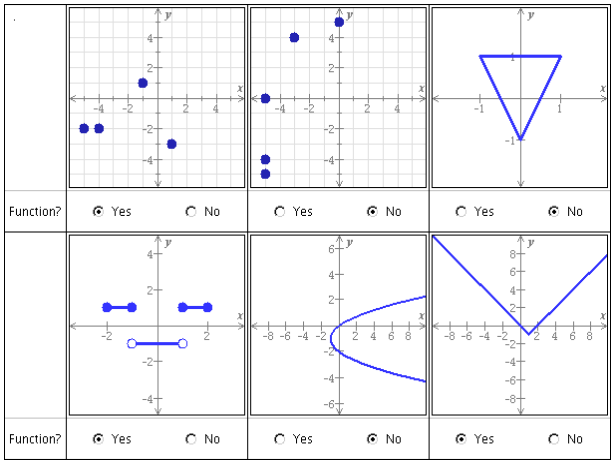
48. $30v^7u^8w^5$

49.



50. $\frac{9+\sqrt{33}}{8}, \frac{9-\sqrt{33}}{8}$

51.

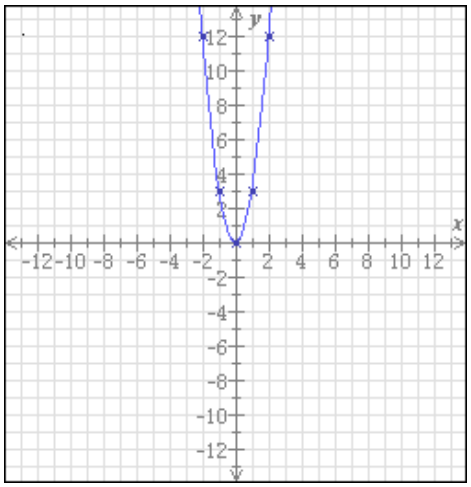


52. 9.73×10^{-4}

53. $\frac{-5+\sqrt{57}}{4}, \frac{-5-\sqrt{57}}{4}$

54. $90y^2 - 70y^6$

55.



56. $D \cup E = [4, \infty)$

$D \cap E = (9, \infty)$

57. 11

58. $20y^6v^7w^5$

59. $2\sqrt{6}$

60. $3\sqrt{5}$