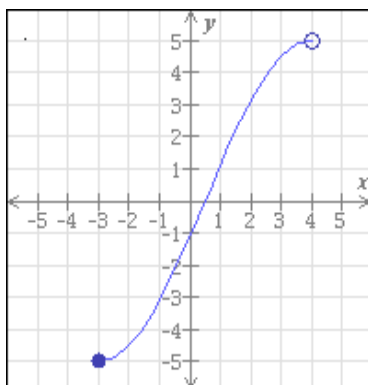


ALEKS® Math 102 Mock Final #4

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

Student Name/ID:

1. The area of a rectangle is 65 ft^2 and the length of the rectangle is 3 ft less than twice the width. Find the dimensions of the rectangle.
2. The entire graph of the function h is shown in the figure below.
Write the domain and range of h using interval notation.



3. Solve.

$$(2+z)(3z-7)=0$$

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

4. Factor $10w^3 - 25w^2$

5. Write 0.0008473 in scientific notation.

6. Use the distributive property to remove the parentheses.

$$8b^5(3b^4 + 9b)$$

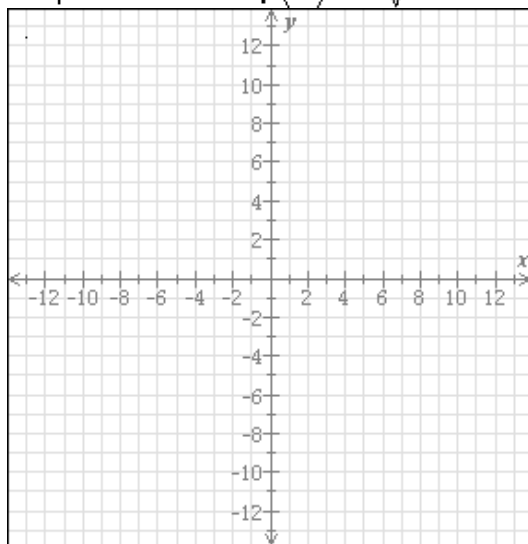
Simplify your answer as much as possible.

7. Find the greatest common factor of $8y$ and $11y^3$

8. The cost C (in dollars) of manufacturing x dresses at Kala's Fashion Warehouse is given by the function $C(x) = 0.3x^2 - 90x + 25,136$. What is the minimum cost of manufacturing dresses?

Do not round your answer.

9. Graph the function $f(x) = 3\sqrt{x} - 6$



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

$$7x - 4y = -20$$

Write your answers in simplest form.

11. Write 784 in scientific notation.

12. The sum of two numbers is 62. The larger number is 10 more than the smaller number. What are the numbers?

13. 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.

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

$$20u^5w^3y^8 \text{ and } 12w^7y^4$$

15. Simplify.

$$\sqrt{\frac{25}{49}}$$

Be sure to write your answer in simplest form.

16. Write 0.00493 in scientific notation.

17. A ball is thrown vertically upward. After t seconds, its height h (in feet) is given by the function

$$h(t) = 64t - 16t^2$$

What is the maximum height that the ball will reach?

Do not round your answer.

18. A motorboat takes 5 hours to travel 150 mi going upstream. The return trip takes 3 hours going downstream. What is the rate of the boat in still water and what is the rate of the current?

Rate of the boat in still water: mi/h

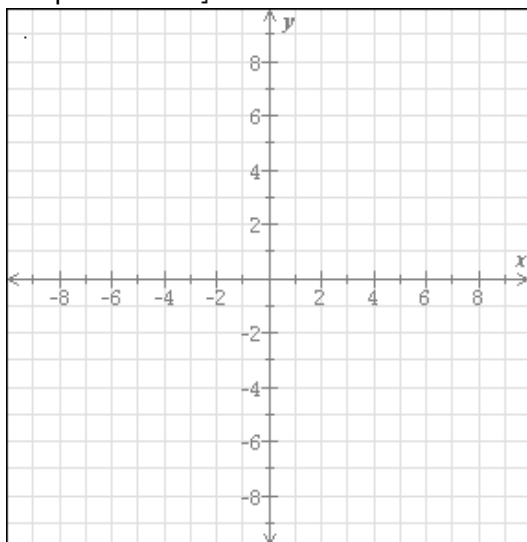
Rate of the current: mi/h

19. Divide.

$$(9x^2z^4 - 16xz) \div (-2x^2z^4)$$

Simplify your answer as much as possible.

20. Graph the line $y = -1$



21. Find the least common multiple of $5x^3$ and $8x^2$

22. Factor.

$$2z^2 - 13z + 18$$

23. Factor.

$$z^2 - 3z - 18$$

24. Fill in the table using this function rule.

$$y = -10x + 2$$

x	y
-5	
-1	
0	
1	

25. Use substitution to solve the system.

$$\begin{aligned}y &= 3x - 9 \\ 2x + 5y &= 23\end{aligned}$$

$$x = \boxed{}$$

$$y = \boxed{}$$

26. Use the quadratic formula to solve for x .

$$2x^2 + 7x - 6 = 0$$

27. Solve for w

$$w^2 - 5w - 14 = 0$$

28. Multiply.

$$(x+8)(x-8)$$

Simplify your answer.

29. The sets C and D are defined as follows.

$$C = \{y \mid y \geq 1\}$$

$$D = \{y \mid y < 6\}$$

Write $C \cup D$ and $C \cap D$ using interval notation.

If the set is empty, write \emptyset

30. Simplify.

$$\frac{a^7}{a^4}$$

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

$\begin{aligned} -x + 3y &= 9 \\ x - 3y &= -9 \end{aligned}$	<p><input type="radio"/> The system has no solution.</p> <p><input type="radio"/> The system has a unique solution: $(x, y) = (\square, \square)$</p> <p><input type="radio"/> The system has infinitely many solutions. They must satisfy the following equation: $y = \square$</p>
$\begin{aligned} x - 4y &= 8 \\ -x + 4y &= 8 \end{aligned}$	<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>

32. 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.

33. Evaluate the expressions.

$$(-7)^0 =$$

$$2\left(\frac{2}{5}\right)^0 =$$

34. Use the quadratic formula to solve for x .

$$7x^2 - 3x - 2 = 0$$

35. Suppose that the relation H is defined as follows.

$$H = \{ (2, 0), (8, -1), (-6, -1) \}$$

Give the domain and range of H

Write your answers using set notation.

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

$$2^5 \times 2^2 \quad \square \quad 2^7$$

$$2^2 \times 5^2 \quad \square \quad 10^2$$

$$2^5 \times 5^2 \quad \square \quad 10^{10}$$

37. A swimming pool has to be drained for maintenance. The pool is shaped like a cylinder with a diameter of 8 m and a depth of 2 m. If the water is pumped out of the pool at the rate of 18 m^3 per hour, how many hours does it take to empty the pool?

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

38. Simplify.

$$\left(v^2 w^{-1}\right)\left(\frac{2 u^{-4} v}{w^{-2}}\right)^3$$

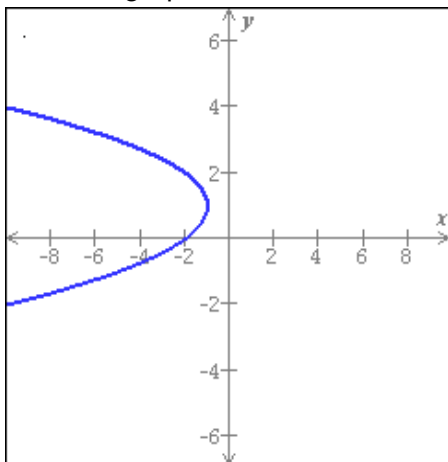
Write your answer using only positive exponents.

39. Give the degree of the polynomial.

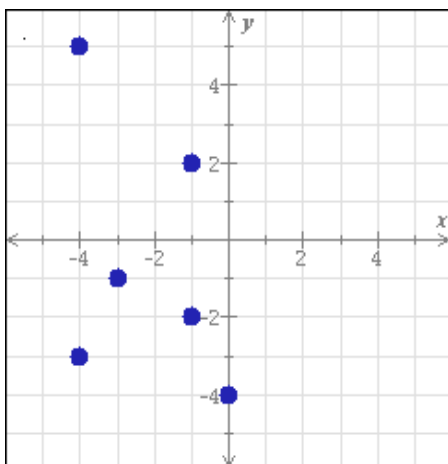
$$2y^{10} - x^5 v + 6 + 14v^5 y^3 x^4$$

40. Solve $(y-6)^2 - 50 = 0$ where y is a real number.
Simplify your answer as much as possible.

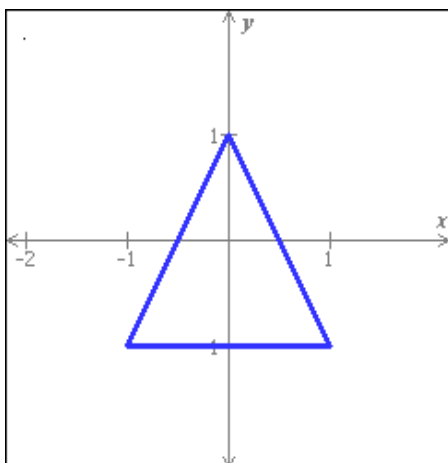
41. For each graph below, state whether it represents a function.



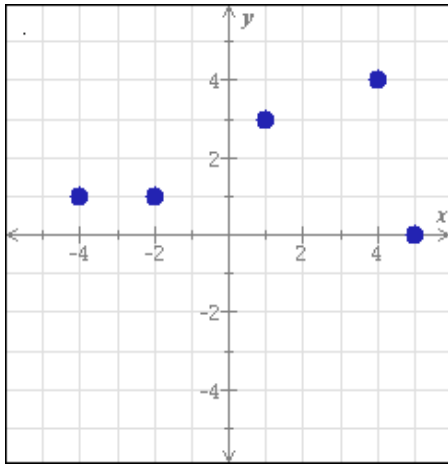
Function?:
Yes No



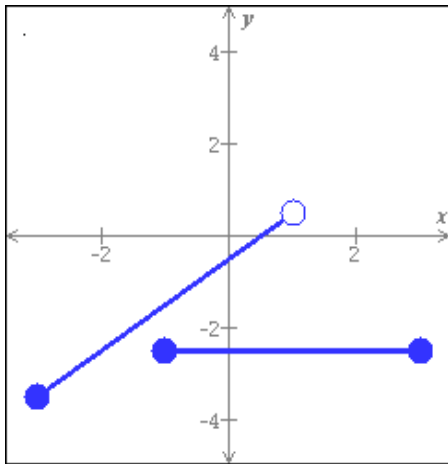
Function?:
Yes No



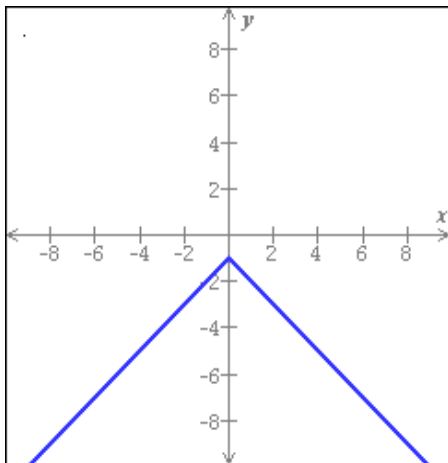
Function?:
Yes No



Function?:
Yes No



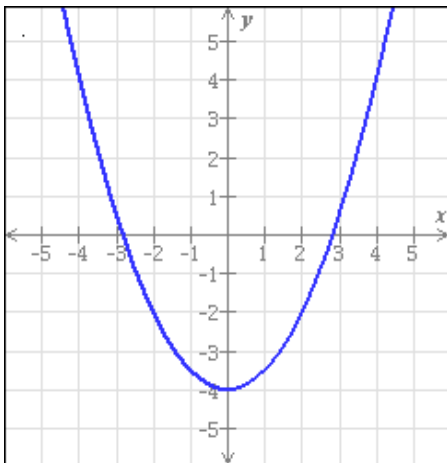
Function?:
Yes No



Function?:
Yes No

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

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



43. Simplify.

$$\sqrt{75}$$

44. Simplify.

$$(-4wu^4)^3$$

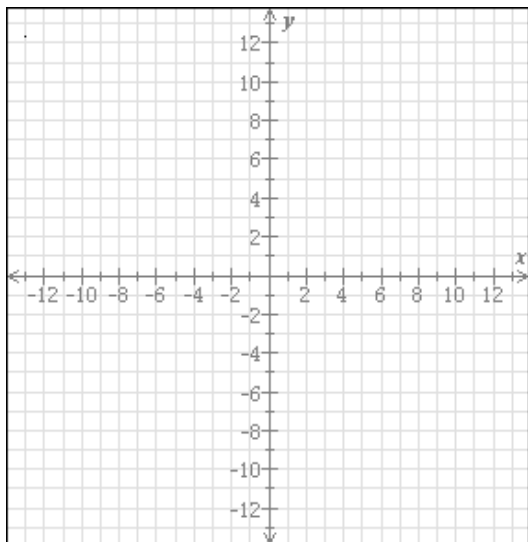
Write your answer without parentheses.

45. Factor:

$$2x^2 + 9xy - 18y^2$$

46. Graph the parabola.

$$y = -x^2$$

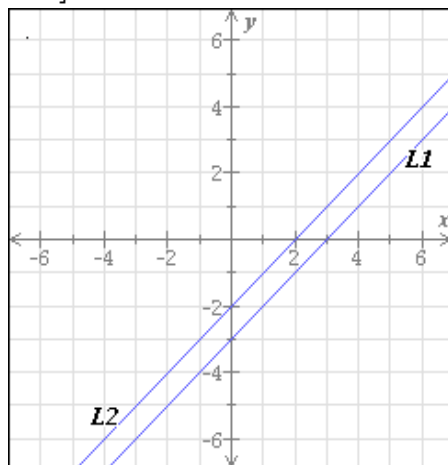


47.

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: $y = x - 2$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

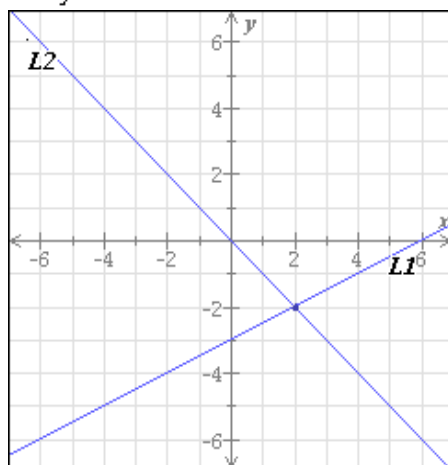
Solution: (\quad, \quad)

- no solution

- infinitely many solutions

L1: $y = \frac{1}{2}x - 3$

L2: $y = -x$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

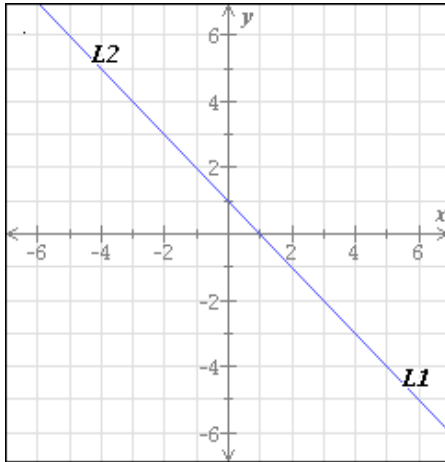
Solution: $\left(\quad , \quad \right)$

- no solution

- infinitely many solutions

L1: $y = -x + 1$

L2: $x + y = 1$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

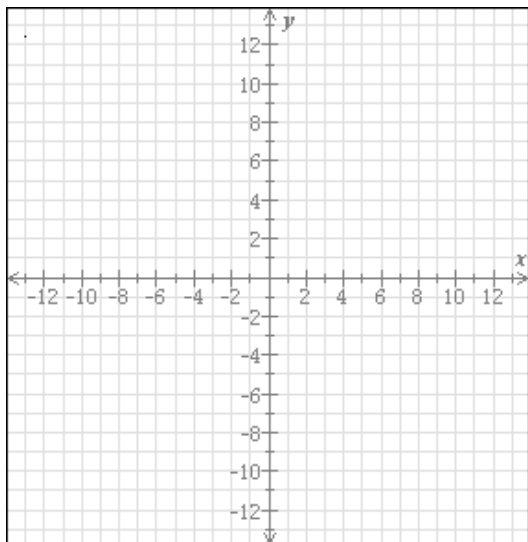
Solution: $\left(\quad , \quad \right)$

- no solution

- infinitely many solutions

48. Graph the parabola.

$$y = -3x^2 + 6x + 1$$



49. Solve for y

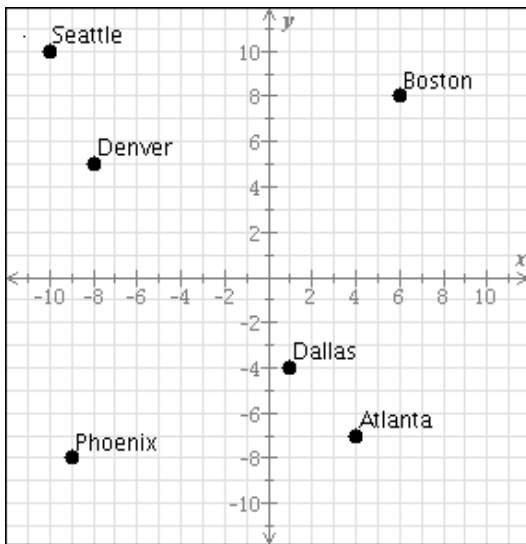
$$(y+5)^2 = 2y^2 + 4y + 30$$

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

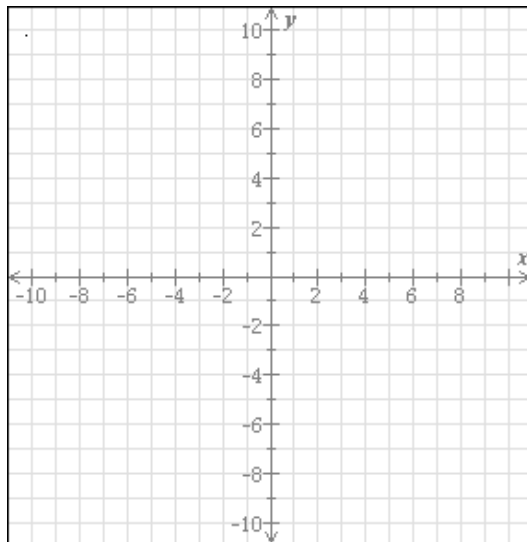
50. Find the least common multiple of these two expressions.

$$6w^4v^7 \text{ and } 14y^8w^5v^2$$

51. Give the location of Seattle as an ordered pair (x, y)



52. Graph the line whose x -intercept is 3 and whose y -intercept is 7



53. Simplify.

$$\sqrt{24}$$

54. Solve the following proportion for x

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

Round your answer to the nearest tenth.

55. Find the domain of the function.

$$v(x) = \sqrt{-x+5}$$

Write your answer using interval notation.

56. Solve the inequality for y

$$-\frac{5}{4}y - 1 > \frac{7}{6}y + \frac{3}{4}$$

Simplify your answer as much as possible.

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

<p>Relation 1</p> <table border="0"> <thead> <tr> <th>Domain</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>rock</td> <td>x</td> </tr> <tr> <td>leaf</td> <td>y</td> </tr> <tr> <td>sun</td> <td>s</td> </tr> <tr> <td>pen</td> <td>x</td> </tr> </tbody> </table> <p> <input type="radio"/> Function <input type="radio"/> Not a Function </p>	Domain	Range	rock	x	leaf	y	sun	s	pen	x	<p>Relation 2</p> <table border="0"> <thead> <tr> <th>Domain</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>7</td> </tr> <tr> <td>-5</td> <td>7</td> </tr> <tr> <td>7</td> <td>2</td> </tr> <tr> <td>-6</td> <td>2</td> </tr> </tbody> </table> <p> <input type="radio"/> Function <input type="radio"/> Not a Function </p>	Domain	Range	0	7	-5	7	7	2	-6	2
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-6	2																				
<p>Relation 3</p> <p>$\{(-4, -7), (-4, -4), (-4, 8), (8, 3)\}$</p> <p> <input type="radio"/> Function <input type="radio"/> Not a Function </p>	<p>Relation 4</p> <p>$\{(m, -5), (g, -5), (m, -7), (x, -5)\}$</p> <p> <input type="radio"/> Function <input type="radio"/> Not a Function </p>																				

58. Solve the following proportion for x

$$\frac{x}{12} = \frac{5}{17}$$

Round your answer to the nearest tenth.

59. Multiply.

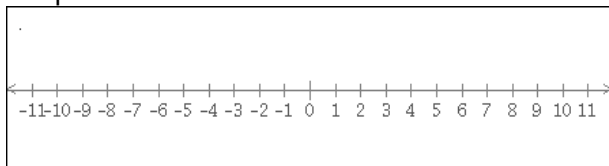
$$(w + 1)(w - 6)$$

Simplify your answer.

60. Solve the compound inequality.

$$-5 < 2x - 3 \leq 3$$

Graph the solution on the number line.



Math 102 Mock Final #4 Answers for class Beginning and Intermediate Algebra Combined / MATH 102 - Fall 2014 – 504

1. Length: 10 ft

Width: 6.5 ft

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

range = $[-5, 5)$

3. $z = -2, \frac{7}{3}$

4. $5w^2(2w - 5)$

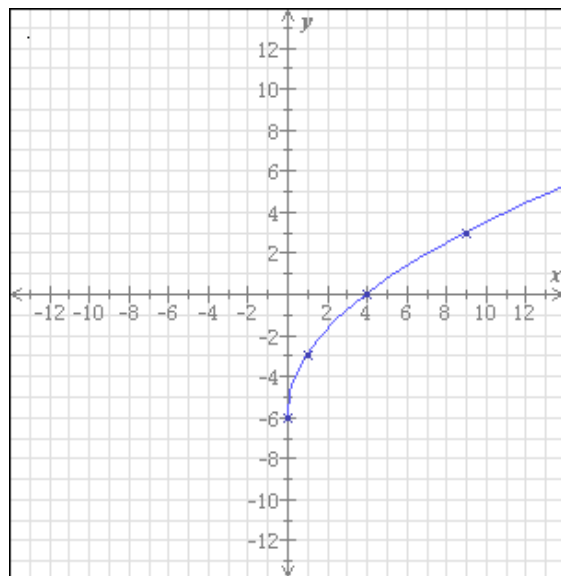
5. 8.473×10^{-4}

6. $24b^9 + 72b^6$

7. y

8. Cost: \$18,386

9.



10. slope: $\frac{7}{4}$

y-intercept: 5

11. 7.84×10^2

12. Larger number: 36

Smaller number: 26

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

vertex: $(2, -9)$

14. $60u^5w^7y^8$

15. $\frac{5}{7}$

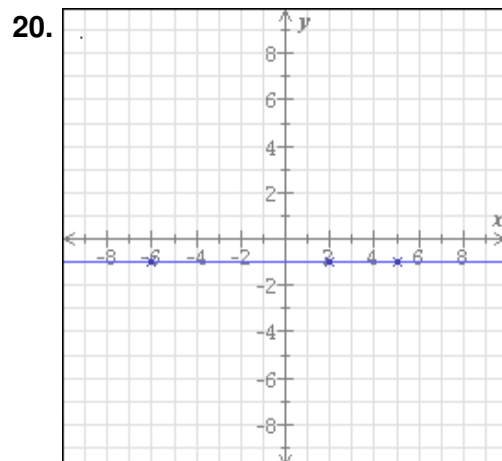
16. 4.93×10^{-3}

17. Height: 64 ft

18. Rate of the boat in still water: 40 mi/h

Rate of the current: 10 mi/h

19. $-\frac{9}{2} + \frac{8}{xz^3}$



21. $40x^3$

22. $(z - 2)(2z - 9)$

23. $(z + 3)(z - 6)$

24.

x	y
-5	52
-1	12
0	2
1	-8

25. $x = 4$
 $y = 3$

26. $\frac{-7+\sqrt{97}}{4}, \frac{-7-\sqrt{97}}{4}$

27. $w = -27$

28. $x^2 - 64$

29. $C \cup D = (-\infty, \infty)$

$C \cap D = [1, 6)$

30. a^3

31.	$\begin{aligned} -x + 3y &= 9 \\ x - 3y &= -9 \end{aligned}$	<p><input type="radio"/> The system has no solution.</p> <p><input type="radio"/> The system has a unique solution:</p> <p>$(x, y) = (\square, \square)$</p> <p><input checked="" type="radio"/> The system has infinitely many solutions. They must satisfy the following equation:</p> <p>$y = \frac{x}{3} + 3$</p>
	$\begin{aligned} x - 4y &= 8 \\ -x + 4y &= 8 \end{aligned}$	<p><input checked="" 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. They must satisfy the following equation:</p> <p>$y = \square$</p>

32. $y = \frac{5}{4}x - 13$

33. $(-7)^0 = 1$
 $2\left(\frac{2}{5}\right)^0 = 2$

34. $\frac{3+\sqrt{65}}{14}, \frac{3-\sqrt{65}}{14}$

35. domain = $\{2, 8, -6\}$
range = $\{0, -1\}$

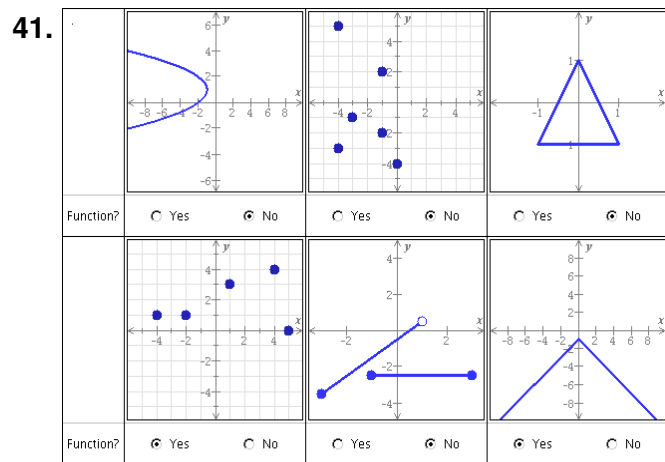
36. $2^5 \times 2^2 = 2^7$
 $2^2 \times 5^2 = 10^2$
 $2^5 \times 5^2 < 10^{10}$

37. 6 hour(s)

38. $\frac{8v^5w^5}{u^{12}}$

39. 12

40. $y = 6 + 5\sqrt{2}, 6 - 5\sqrt{2}$



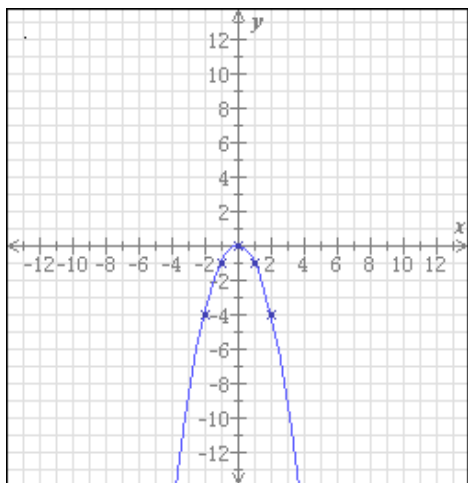
42. $f(2) = -2$
 One value of x for which $f(x) = -4$: 0

43. $5\sqrt{3}$

44. $-64w^3u^{12}$

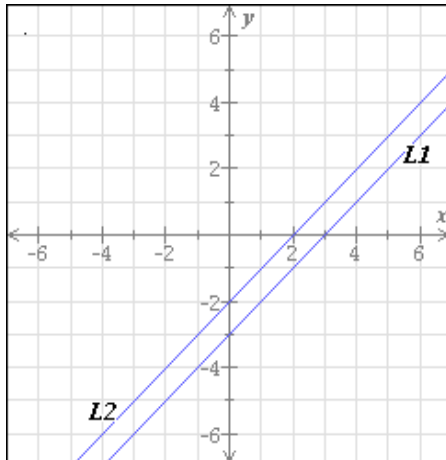
45. $(x+6y)(2x-3y)$

46.



47. L1: $y = x - 3$

L2: $y = x - 2$



This system of equations is:

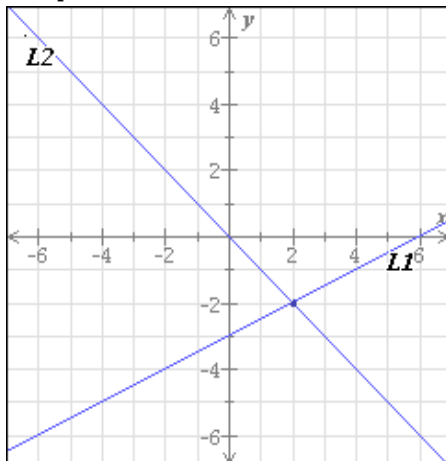
- inconsistent

This means the system has:

- no solution

L1: $y = \frac{1}{2}x - 3$

L2: $y = -x$



This system of equations is:

- consistent independent

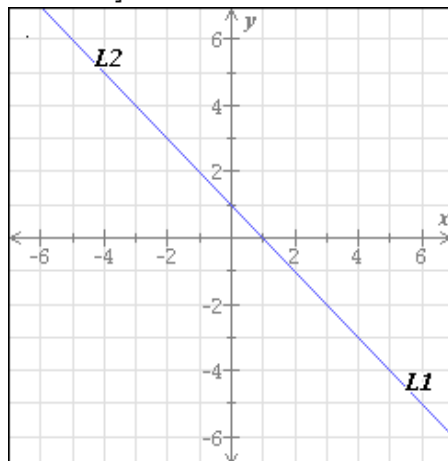
This means the system has:

- a unique solution:

Solution: $(2, -2)$

$$L1: y = -x + 1$$

$$L2: x + y = 1$$



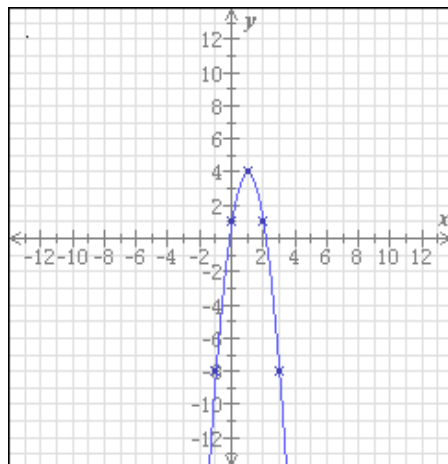
This system of equations is:

- consistent dependent

This means the system has:

- infinitely many solutions

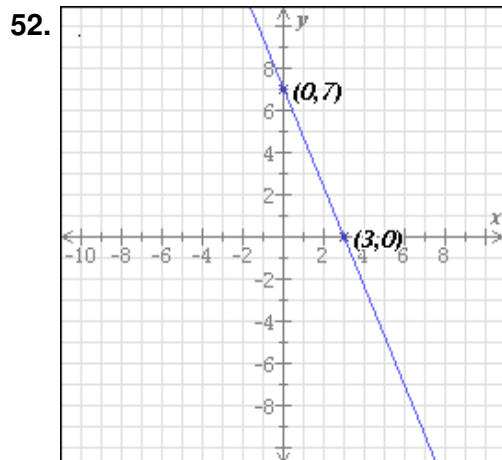
48.



49. $y = 1,5$

50. $42y^8w^5v^7$

51. $(x,y) = (-10,10)$



53. $2\sqrt{6}$

54. $x = 2.1$

55. $(-\infty, 5]$

56. $y < -\frac{21}{29}$

57.

Relation 1		Relation 2	
Domain	Range	Domain	Range
rock		0	7
leaf		-5	
sun		7	2
pen		-6	
<input type="radio"/> Function <input checked="" type="radio"/> Not a Function		<input checked="" type="radio"/> Function <input type="radio"/> Not a Function	

Relation 3	Relation 4
$\{(-4, -7), (-4, -4), (-4, 8), (8, 3)\}$	$\{(m, -5), (g, -5), (m, -7), (x, -5)\}$
<input type="radio"/> Function <input checked="" type="radio"/> Not a Function	<input type="radio"/> Function <input checked="" type="radio"/> Not a Function

58. $x = 3.5$

59. $w^2 - 5w - 6$

