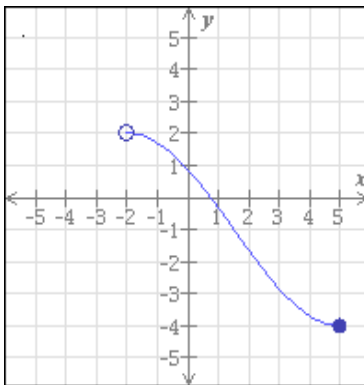


ALEKS® Math 102 Mock Final #3

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

Student Name/ID:

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



2. Simplify.

$$\sqrt{45}$$

3. Solve for y

$$y^2 + y - 12 = 0$$

4. Simplify.

$$\sqrt{\frac{36}{25}}$$

Be sure to write your answer in simplest form.

5. Simplify.

$$\sqrt{75}$$

6. Write 745,000 in scientific notation.

7. A swimming pool has to be drained for maintenance. The pool is shaped like a cylinder with a diameter of 9 m and a depth of 2 m. If the water is pumped out of the pool at the rate of 14 m^3 per hour, how many hours does it take to empty the pool?

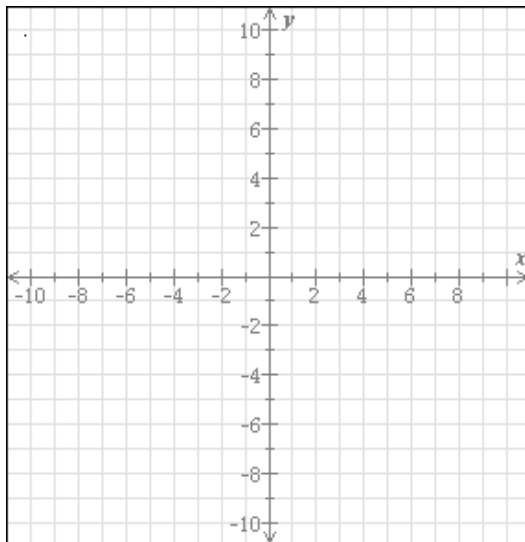
Use the value 3.14 for π and round your answer to the nearest hour.

8. Solve the following proportion for v .

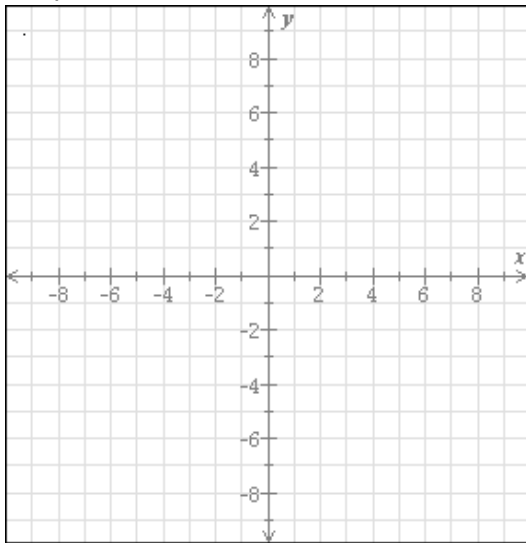
$$\frac{11}{3} = \frac{v}{10}$$

Round your answer to the nearest tenth.

9. Graph the line whose x -intercept is 4 and whose y -intercept is -3



10. Graph the line $x = -1$



11. Solve.

$$(5 - z)(3z + 4) = 0$$

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

12. Find the greatest common factor of $9w^3$ and $8w^2$

13. Solve for v

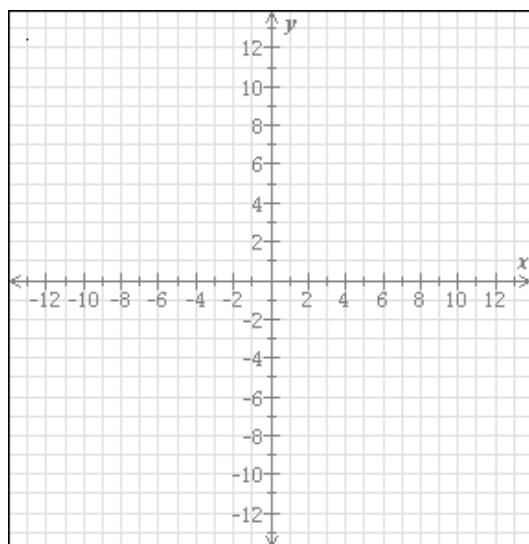
$$(v+4)^2 = 2v^2 + 4v + 11$$

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

14. Write 0.000973 in scientific notation.

15. Graph the parabola.

$$y = -2x^2 + 4x - 4$$



16. Use the quadratic formula to solve for x .

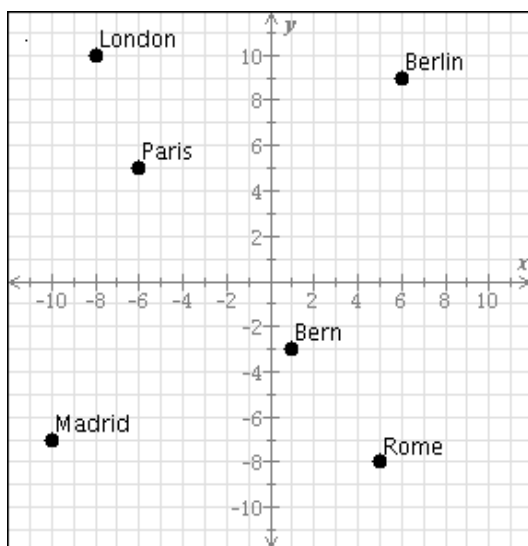
$$2x^2 + 5x - 4 = 0$$

17. Solve the inequality for v

$$2 - \frac{9}{2}v > \frac{7}{2} - \frac{5}{6}v$$

Simplify your answer as much as possible.

18. Give the location of London as an ordered pair (x, y)



19. Use the distributive property to remove the parentheses.

$$5x^7(6x^2 + 4x)$$

Simplify your answer as much as possible.

20. Factor.

$$z^2 - 9z + 18$$

21. Use substitution to solve the system.

$$y = 3x - 5$$

$$2x - 5y = 12$$

$$x = \boxed{}$$

$$y = \boxed{}$$

22. Factor.

$$14z^2 + 11z - 3$$

23. Find the least common multiple of $7m^2$ and $4m^4$

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

$$4y^6v^7w^4 \text{ and } 10y^3w^5$$

25. The cost C (in dollars) of manufacturing x radios at Jim's Stereo World is given by the function

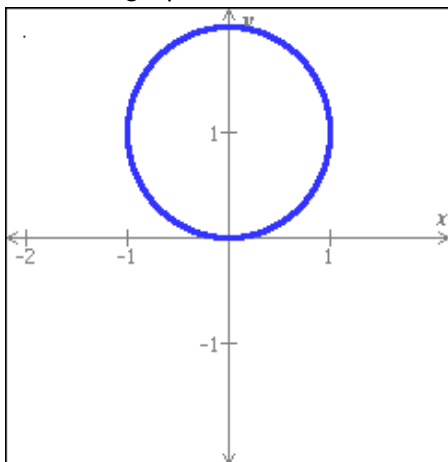
$$C(x) = 0.4x^2 - 208x + 32,199$$
 What is the minimum cost of manufacturing radios?

Do not round your answer.

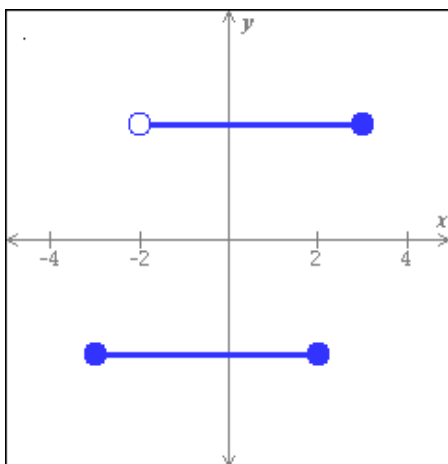
26. Use the quadratic formula to solve for x .

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

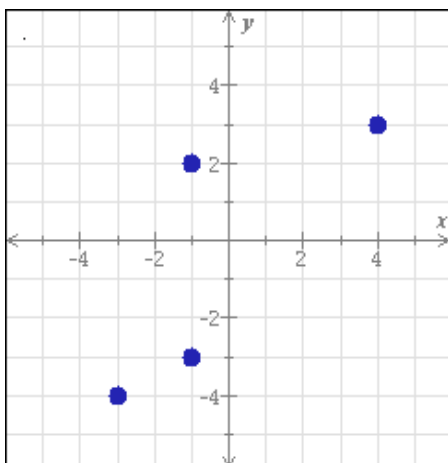
27. For each graph below, state whether it represents a function.



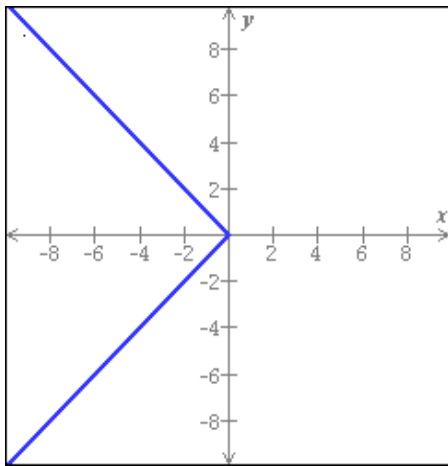
Function?:
Yes No



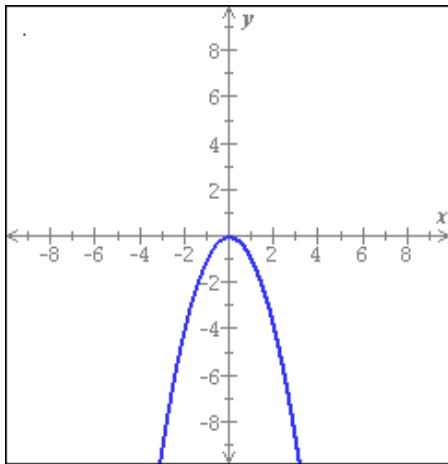
Function?:
Yes No



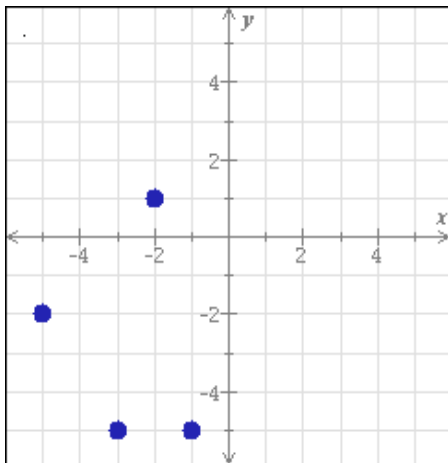
Function?:
Yes No



Function?:
Yes No



Function?:
Yes No



Function?:
Yes No

28. Evaluate the expressions.

$$-(2)^0 =$$

$$\left(-\frac{1}{5}\right)^0 =$$

29. Fill in the table using this function rule.

$$y = -4x + 2$$

x	y
-1	
0	
1	
2	

30. Factor $9y^2 - 15y^3$

31. Divide.

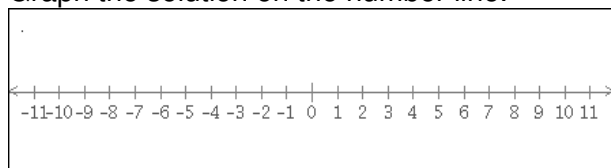
$$\left(-15v^4x^2 + 4v^3x\right) \div \left(-2v^4x^2\right)$$

Simplify your answer as much as possible.

32. Solve the compound inequality.

$$7 < 2x + 5 \leq 17$$

Graph the solution on the number line.

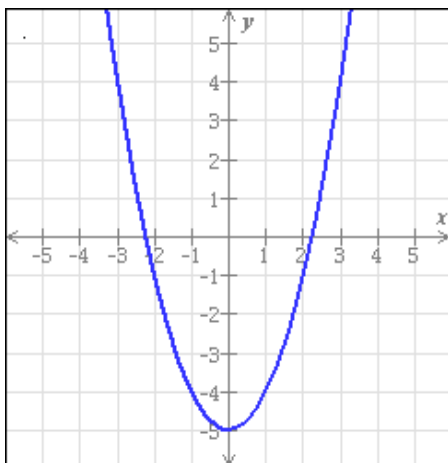


33. For each relation, decide whether or not it is a function.

<p>Relation 1</p> <table border="0"> <thead> <tr> <th>Domain</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>m</td> <td rowspan="2">pen</td> </tr> <tr> <td>s</td> </tr> <tr> <td>k</td> <td rowspan="3">paper</td> </tr> <tr> <td>f</td> </tr> <tr> <td>n</td> </tr> </tbody> </table> <p> <input type="radio"/> Function <input type="radio"/> Not a Function </p>	Domain	Range	m	pen	s	k	paper	f	n	<p>Relation 2</p> <table border="0"> <thead> <tr> <th>Domain</th> <th>Range</th> </tr> </thead> <tbody> <tr> <td>d</td> <td rowspan="2">d</td> </tr> <tr> <td>k</td> </tr> <tr> <td>g</td> <td rowspan="2">k</td> </tr> <tr> <td>t</td> </tr> </tbody> </table> <p> <input type="radio"/> Function <input type="radio"/> Not a Function </p>	Domain	Range	d	d	k	g	k	t
Domain	Range																	
m	pen																	
s																		
k	paper																	
f																		
n																		
Domain	Range																	
d	d																	
k																		
g	k																	
t																		
<p>Relation 3</p> <p>$\{(0,n),(0,t),(0,d),(0,x)\}$</p> <p> <input type="radio"/> Function <input type="radio"/> Not a Function </p>	<p>Relation 4</p> <p>$\{(-3,3),(-2,-3),(-3,2),(-2,2)\}$</p> <p> <input type="radio"/> Function <input type="radio"/> Not a Function </p>																	

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

Find $f(1)$ and find one value of x for which $f(x) = -1$



35. 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>
$\begin{aligned} x - 2y &= -8 \\ -x + 2y &= 8 \end{aligned}$	<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>

36. Write 0.0008473 in scientific notation.

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

$$H = \{ (7, 6), (-2, 4), (7, -9), (0, -2) \}$$

Give the domain and range of H

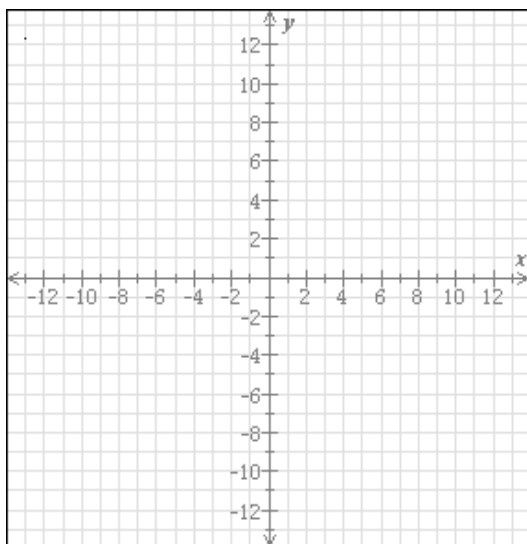
Write your answers using set notation.

38. Factor:

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

39. Graph the parabola.

$$y = -x^2$$



40. The sum of two numbers is 67 The larger number is 17 more than the smaller number. What are the numbers?

41. Find the domain of the function.

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

Write your answer using interval notation.

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

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

43. Simplify.

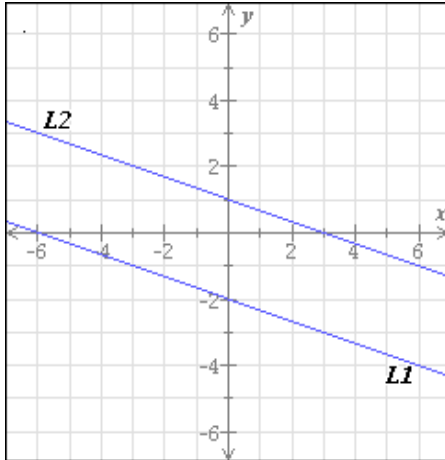
$$\frac{y^6}{y^2}$$

44.

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.

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

$$L2: y = \frac{-1}{3}x + 1$$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

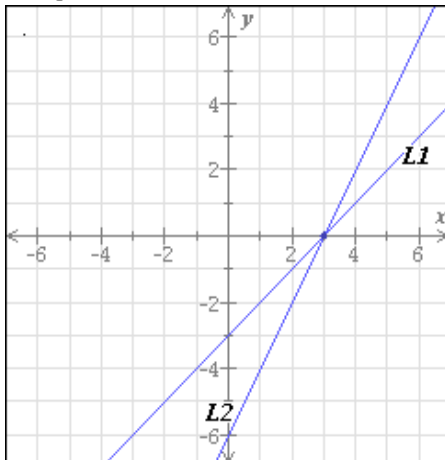
Solution: (,)

- no solution

- infinitely many solutions

$$L1: y = x - 3$$

$$L2: y = 2x - 6$$



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

- a unique solution:

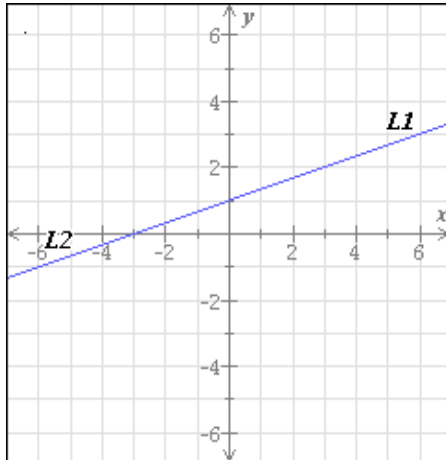
Solution: (\quad, \quad)

- no solution

- infinitely many solutions

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

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



This system of equations is:

- consistent dependent - consistent independent - inconsistent

This means the system has:

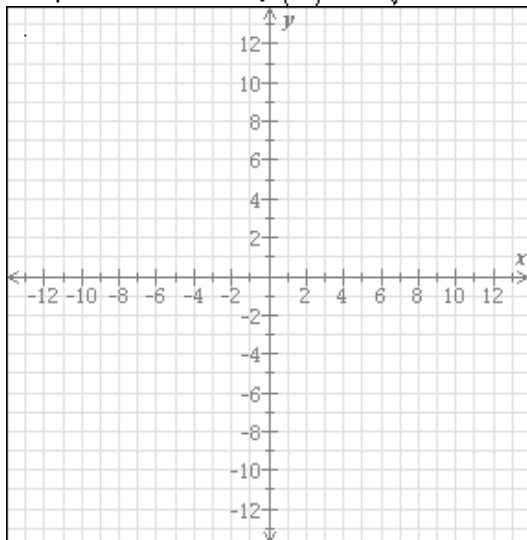
- a unique solution:

Solution: (\quad, \quad)

- no solution

- infinitely many solutions

45. Graph the function $f(x) = 2\sqrt{x} - 5$



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

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

Write your answers in simplest form.

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

$$h(t) = 56t - 16t^2$$

What is the maximum height that the ball will reach?

Do not round your answer.

48. A line passes through the point $(-4, -6)$ and has a slope of $\frac{5}{2}$

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

49. Multiply.

$$(u - 8)(u + 8)$$

Simplify your answer.

50. Solve the following proportion for x

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

Round your answer to the nearest tenth.

51. Solve $(y + 6)^2 - 72 = 0$ where y is a real number.
Simplify your answer as much as possible.

52. Simplify.

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

Write your answer using only positive exponents.

53. A motorboat takes 3 hours to travel 144 km going upstream. The return trip takes 2 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: km/h

Rate of the current: km/h

54. Give the degree of the polynomial.

$$7x^5v^3y^4 + y^5x - 2v^{10} + 6$$

55. Find the x -intercept(s) and the coordinates of the vertex for the parabola $y = x^2 - 8x + 12$. If there is more than one x -intercept, separate them with commas.

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

$$\begin{array}{l} 2^2 \times 5^2 \square 10^2 \\ 2^5 \times 2^2 \square 2^{10} \\ 2^5 \times 5^2 \square 10^{10} \end{array}$$

57. Multiply.

$$(y+1)(y-6)$$

Simplify your answer.

58. The length of a rectangle is 1 m less than twice the width, and the area of the rectangle is 21 m^2 . Find the dimensions of the rectangle.

59. Simplify.

$$(-2u^3v)^4$$

Write your answer without parentheses.

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

$$C = \{x \mid x > 3\}$$

$$D = \{x \mid x \leq 6\}$$

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

If the set is empty, write \emptyset

Math 102 Mock Final #3 Answers for class Beginning and Intermediate Algebra Combined / MATH 102 - Fall 2014 – 504

1. domain = $(-2, 5]$
range = $[-4, 2)$

2. $3\sqrt{5}$

3. $y = 3 - 4$

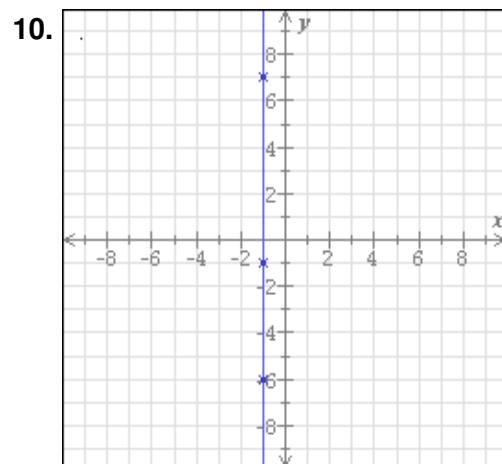
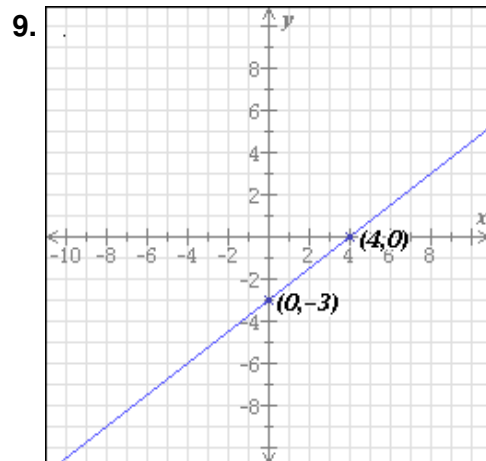
4. $\frac{6}{5}$

5. $5\sqrt{3}$

6. 7.45×10^5

7. 9 hour(s)

8. $v = 36.7$

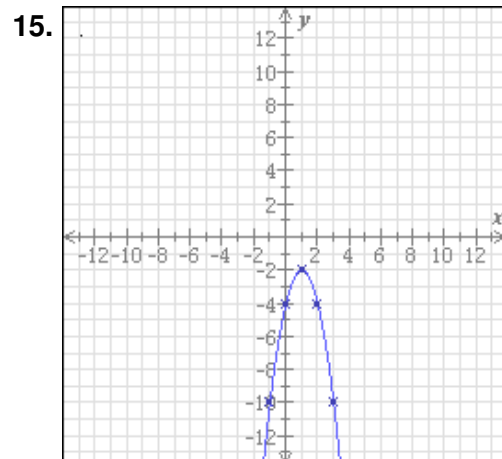


11. $z = 5, -\frac{4}{3}$

12. w^2

13. $v = -1, 5$

14. 9.73×10^{-4}



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

17. $v < -\frac{9}{22}$

18. $(x, y) = (-8, 10)$

19. $30x^9 + 20x^8$

20. $(z - 3)(z - 6)$

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

22. $(z + 1)(14z - 3)$

23. $28m^4$

24. $20y^6 v^7 w^5$

25. Cost: \$5159

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

27.

Function? <input type="radio"/> Yes <input checked="" type="radio"/> No	Function? <input type="radio"/> Yes <input checked="" type="radio"/> No	Function? <input type="radio"/> Yes <input checked="" type="radio"/> No
Function? <input type="radio"/> Yes <input checked="" type="radio"/> No	Function? <input checked="" type="radio"/> Yes <input type="radio"/> No	Function? <input checked="" type="radio"/> Yes <input type="radio"/> No

28.

$$-(2)^0 = -1$$

$$\left(-\frac{1}{5}\right)^0 = 1$$

29.

x	y
-1	6
0	2
1	-2
2	-6

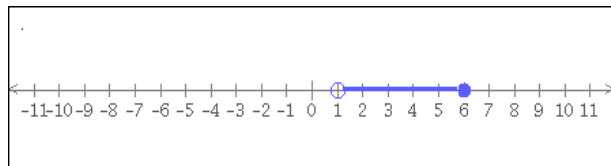
30.

$$3y^2(3-5y)$$

31.

$$\frac{15}{2} - \frac{2}{vx}$$

32.



33.

<p>Relation 1</p> <p>Domain Range</p> <p> <input checked="" type="radio"/> Function <input type="radio"/> Not a Function </p>	<p>Relation 2</p> <p>Domain Range</p> <p> <input type="radio"/> Function <input checked="" type="radio"/> Not a Function </p>
<p>Relation 3</p> <p>$\{(0, n), (0, t), (0, d), (0, x)\}$</p> <p> <input type="radio"/> Function <input checked="" type="radio"/> Not a Function </p>	<p>Relation 4</p> <p>$\{(-3, 3), (-2, -3), (-3, 2), (-2, 2)\}$</p> <p> <input type="radio"/> Function <input checked="" type="radio"/> Not a Function </p>

34. $f(1) = -4$

One value of x for which $f(x) = -1$: -2

35.

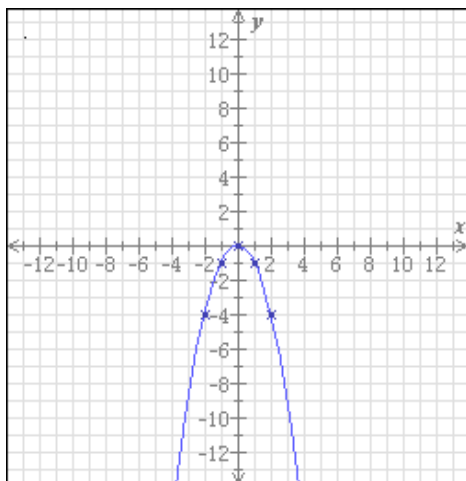
$-x + 3y = 9$ $x - 3y = 9$	<p> <input checked="" type="radio"/> The system has no solution. <input type="radio"/> The system has a unique solution: $(x, y) = (\square, \square)$ <input type="radio"/> The system has infinitely many solutions. They must satisfy the following equation: $y = \square$ </p>
$x - 2y = -8$ $-x + 2y = 8$	<p> <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: $y = \frac{x}{2} + 4$ </p>

36. 8.473×10^{-4}

37. domain = $\{7, -2, 0\}$
range = $\{6, 4, -9, -2\}$

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

39.



40. Larger number: 42

Smaller number: 25

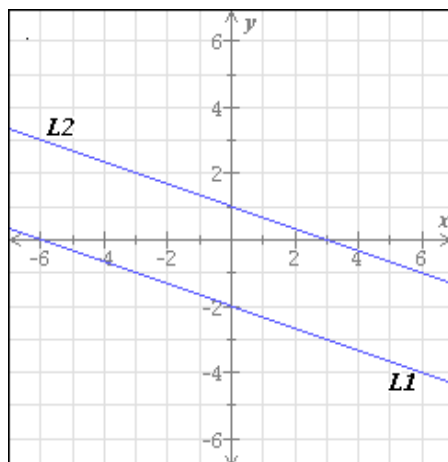
41. $(-\infty, 5]$

42. $60u^5w^7y^8$

43. y^4

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

L2: $y = \frac{-1}{3}x + 1$



This system of equations is:

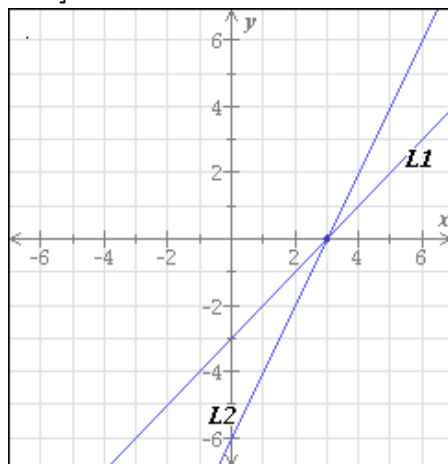
- inconsistent

This means the system has:

- no solution

L1: $y = x - 3$

L2: $y = 2x - 6$



This system of equations is:

- consistent independent

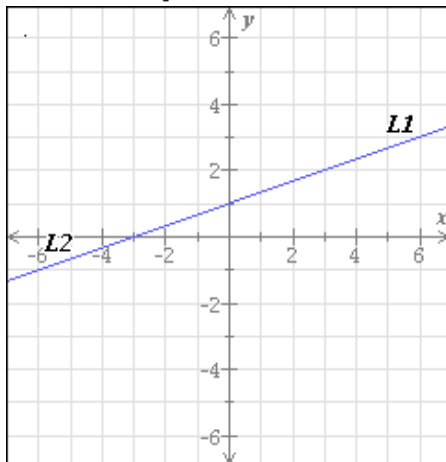
This means the system has:

- a unique solution:

Solution: $(3, 0)$

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

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



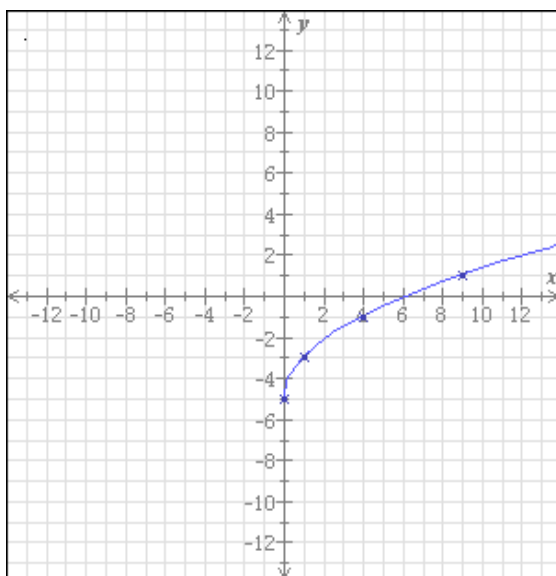
This system of equations is:

- consistent dependent

This means the system has:

- infinitely many solutions

45.



46.

slope: $\frac{7}{2}$

y-intercept: 1

47. Height: 49 ft

48. $y = \frac{5}{2}x + 4$

49. $u^2 - 64$

50. $x = 2.1$

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

52. $\frac{27v^3w^5}{u^3}$

53. Rate of the boat in still water: 60 km/h

Rate of the current: 12 km/h

54. 12

55. x-intercept(s): 2, 6
vertex: (4, -4)

56. $2^2 \times 5^2 = 10^2$
 $2^5 \times 2^2 < 2^{10}$
 $2^5 \times 5^2 < 10^{10}$

57. $y^2 - 5y - 6$

58. Length: 6 m

Width: 3.5 m

59. $16u^{12}v^4$

60. $C \cap D = (3, 6]$

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