

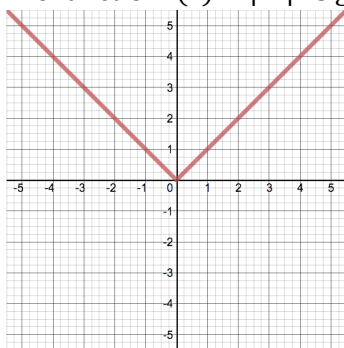
1. Solve: $|-2x + 3| = 29$

- a. $x = -13$
- b. $x = -13, 13$
- c. $x = -13, 16$
- d. $x = 16, -16$

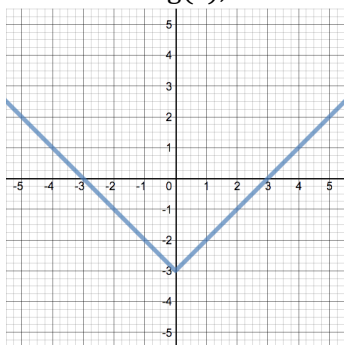
2. What are the solutions to $|x| = -3$? Select all that apply.

- a. -3
- b. 3
- c. 0
- d. No solution

3. The function $f(x) = |x|$ is graphed below.



The function $g(x)$, a transformation of $f(x)$, is shown below. Determine the equation for $g(x)$.



- a. $y = |x| - 3$
- b. $y = |x| + 3$
- c. $y = |x - 3|$
- d. $y = |x + 3|$

4. What is the value of 2^{-3} ?

- a. 8
- b. $1/8$
- c. -8
- d. -6

5. Which points are on the graph of the equation $3 - 6x + 2y = -5$? Select **all** that apply.
- $(-2, -10)$
 - $(-1, 1)$
 - $(0, 4)$
 - $(4, 8)$
 - $(6, 14)$
6. Which points are on the same line that passes through $(-8, 3)$, $(16, 9)$, and $(32, 13)$? Select **all** that apply.
- $(-4, 4)$
 - $(-1, 1)$
 - $(0, 5)$
 - $(2, -3)$
 - $(8, 7)$
7. In the equation $y = 35(5^x)$, what value does the 35 represent?
- y-intercept
 - starting value
 - growth factor
 - growth rate

8. What is the y intercept of the following relationship?

x	1	2	3	4	5
y	200	800	3200	12800	51200

- 50
 - 0
 - 4
 - 200
9. Let x and y represent irrational numbers. Which expression could represent a rational number? Select **all** that apply.
- $-x$
 - $x + y$
 - xy
 - y^2
 - $x - y$
 - $\frac{x}{y}$
10. A basketball game sells admission tickets for \$5.00 on Wednesday nights. At capacity, the theater holds 500 customers. The function $B(n) = 5n$ represents the amount of money the theater takes in on Wednesday nights, where n is the number of customers. What is the domain of $B(n)$ in this context?
- all whole numbers
 - all non-negative rational numbers
 - all non-negative integers that are multiples of 5
 - all non-negative integers less than or equal to 500

11. Below is the perimeter formula for a rectangle in terms of length and width. Which of the following represents the width in terms of the perimeter and length?

$$P = 2l + 2w$$

a. $w = \frac{P}{2} - 2l$

b. $w = \frac{P - 2l}{2}$

c. $w = \frac{P}{2} + l$

d. $w = \frac{P - 2}{2l}$

12. Multiply $(3x + 4)(2x - 4)$

a. $6x^2 - 4x - 16$

b. $6x^2 + 4x - 16$

c. $3x^2 + 4x - 4$

d. $2x^2 + 4x - 16$

13. Factor completely: $9x^2 + 36x + 12$

a. $(9x + 3)(x + 4)$

b. $(x + 3)(x + 4)$

c. $(9x + 36)(x + 12)$

d. Not factorable

14. Factor completely: $2x^2 + 9x - 35$

a. not factorable

b. $(2x - 5)(x + 7)$

c. $(x - 7)(2x + 7)$

d. $(2x + 5)(x - 7)$

15. Solve for x: $x^2 - 3x - 28 = 0$

a. $x = -3$ & 28

b. $x = 1$ & -3

c. $x = -7$ & 4

d. $x = 7$ & -4

16. Solve for x: $2x^2 - 7x - 4 = 0$

a. $x = -1/2$ & -4

b. $x = 1/2$ & 4

c. $x = -1/2$ & 4

d. $x = 1/2$ & -4

17. Find the equation that is equivalent to the quadratic equation shown.

$$x^2 - 4x - 32 = 0$$

- a. $x(x - 2) = 32$
- b. $(x - 4)^2 = 64$
- c. $(x - 2)^2 = 48$
- d. $(x - 2)^2 = 36$

18. Which of the following points represent zeros of the function $f(x) = (x^2 + 3x - 10)(x - 3)$. Select **all** that apply.

- a. (2, 0)
- b. (-5, 0)
- c. (0, -3)
- d. (-3, 0)
- e. (3, 0)
- f. (0, 2)
- g. (0, -5)

19. The solution to $(x - 9)^2 = 16$ is

- a. 13 and 5
- b. -1 and 7
- c. -5 and 5
- d. -4 and -14

20. What value goes on the blank to complete the square: $x^2 - 18x + \underline{\hspace{1cm}}$?

- a. -81
- b. -9
- c. 9
- d. 81

21. What is the discriminant of $4x^2 + 6x + 2 = 0$?

- a. 2
- b. 4
- c. 32
- d. 68

22. How many real zeros does an equation have if the discriminant is -7?

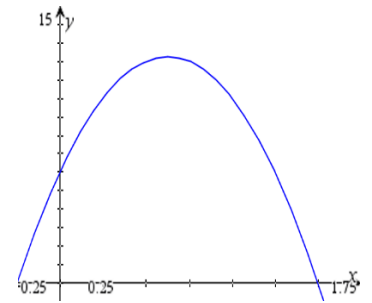
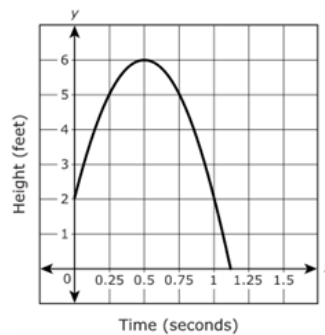
- a. 0
- b. 1
- c. 2
- d. Not enough information

23. At the beginning of an experiment, the number of bacteria in a colony was counted at time $t = 0$. The number of bacteria in the colony t hours after the initial count is modeled by the function $b(t) = 3(2)^t$. Which value and unit represent the average rate of change in the number of bacteria for the first 3 hours of the experiment? Select **all** that apply.

- a. 14.0
- b. 11.25
- c. 7
- d. 10.5
- e. bacteria
- f. hours
- g. bacteria per hour
- h. hour per bacteria

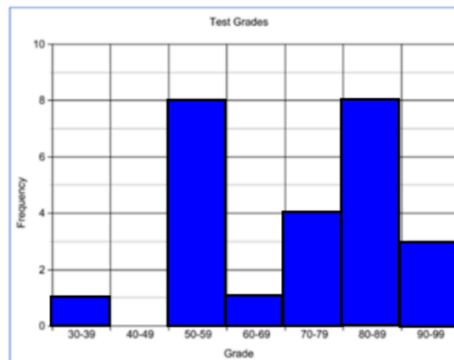
24. A soccer ball was 6 feet off the ground when a player hit it so that the ball traveled up in the air before coming back to the ground. The height of the ball is described by the graph shown. Use the graph to estimate the average rate of change of the height of the ball for the first 0.5 second after being hit.

- a. 2 feet per second
- b. 3.5 feet per second
- c. 7 feet per second
- d. 14 feet per second



25. Use the histogram to determine the number of students that scored below 80 on the test.

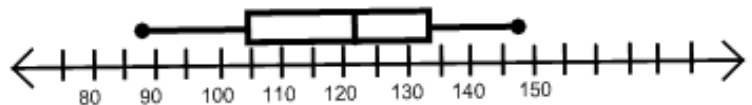
- a. 4
- b. 6
- c. 8
- d. 14



26. Use the box and whisker graph to determine the true statement.

75% of the data is:

- a. between 105 and 147
- b. between 87 and 122
- c. between 122 and 147
- d. between 105 and 132



27. Given the points (3, 9) and (5, 17) on a scatter graph, determine the equation for the best line of fit.

a. $y = -4x - 3$

b. $y = 3x - 2$

c. $y = 4x - 3$

d. $y = 2x - 5$

28. If the prediction equation is $y = 0.48t + 61$ calculate the grade of someone who studied for 59 minutes.

a. 87.6

b. 84.8

c. 91.7

d. 89.3

29. The cost to manufacture x pairs of calculators can be represented by a function, $C(x)$. Select from the drop-down menus to correctly complete the statement about the functions C .

If $C(6) = 525$, then _____ calculators cost \$ _____ .

• 0
• 1
• 6
• 87.5
• 525

• 6.00
• 525.00
• 3150.00

30. Solve for x : $5 + |-4x + 9| = 42$

31. Explain how the meanings of 9^2 , 2^9 and 92 differ.

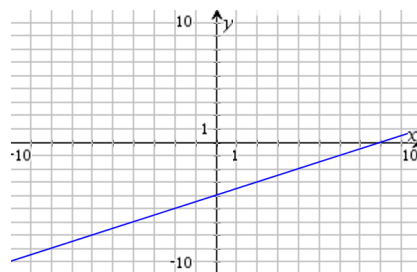
32. Suppose there is an initial rabbit population in the forest of 10,000 rabbits. The growth factor for the population is 1.7 per year. How large will the rabbit population be in year 4?

33. Simplify $2x^2 + 6 - 5x + 7 - 14x^2 - 2x =$ _____

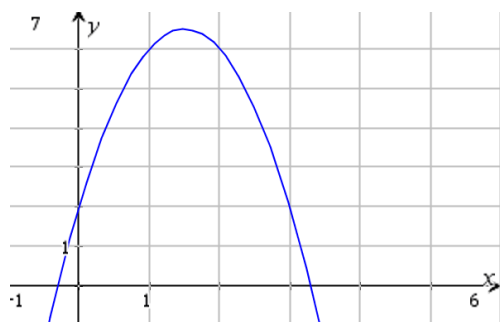
34. Solve $3x^2 + 6x - 5 = 0$

35. Determine what type of function $f(x) = -(x - 2)^2 + 4$ is, then graph it.

36. The graph of $f(x)$ is shown on the coordinate plane below. For what value of x does $f(x) = 0$?



37. The figure shows a graph of the function $f(x)$ in the xy -coordinate plane.



A second function g is defined by $g(x) = -2x + 1$. Select the correct phrase in each drop down menu to complete the sentence.

$f(3)$ _____ $g(3)$ and $f(-3)$ _____ $g(-3)$.

a. is less than
b. is greater than

c. is less than
d. is greater than

38. What measure of central tendency: mean, mode, or median, is the largest for the given set of data and what is its value?

83, 67, 98, 89, 72, 59, 100, 62, 72

39. What score must Fred obtain on his 7th test to have an 83 average?

Test Grades: 89, 78, 85, 71, 88, 90

40. Do the points on the line $y = 4x + 1$ have a constant ratio of the y -coordinate to the x -coordinate for any point on the line except the x -intercept? Explain your answer.

41. Given the function $f(x) = x + 1$, describe the difference in transformation between $y = f(-3x)$ and $y = -3f(x)$.

42. The original function is $f(x) = 0.5x + 2$. The new function, $g(x)$ is the equation of $f(x)$ after a reflection across the y -axis and a vertical stretch with a constant of 2.5. What is the equation of $g(x)$?

43. What type of function does the following table create? What is the shape of its graph?

x	y
-1	3
0	2
1	3
2	6

44. Given the function $f(x) = x^2 + 3$, write the transformation that will result in $g(x) = f(x) - 3$ and $h(x) = f(x - 1) + 5$.

45. Given the function $f(x) = x^2$, graph the transformation of two units to the left and 4 units up. Then write the new function as $g(x)$.

46. Consider the function $f(x) = 2x^2 - 4x - 6$.

A. Rewrite the equation to reveal the vertex of the graph of the function.

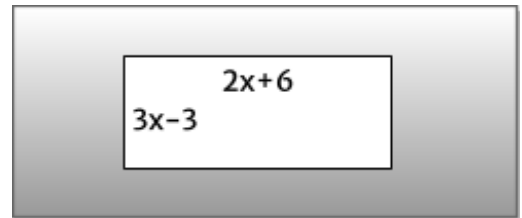
B. Rewrite the equation to reveal the zeros of the function.

47. The town is building a community swimming pool as shown.

A. What is the area of the pool?

B. What are the dimensions of the deck if its length is 2 times the pool's and its width is 3 times the pool's?

C. What is the area of the deck?



48. The function $f(x) = x^2 - 6x$ is graphed below.

- A. Drag the correct word to the box with each given interval to indicate whether the function is increasing or decreasing on that interval.

Increasing

Decreasing

$x < 0$	$0 < x < 3$	$3 < x < 6$	$x > 6$
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- B. Drag the appropriate value to the box with each given interval.

$f(x) < 0$

$f(x) > 0$

$x < 0$	$0 < x < 3$	$3 < x < 6$	$x > 6$
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49. Use the data in the table to create the following:

82	79	68
100	76	68
84	89	79
71	80	68
77	66	86

A. Create a box and whisker plot

B. Create a histogram

50. Leah would like to earn at least \$240 per month. She babysits for \$8 per hour and works as an intern for \$12 per hour. Leah cannot work more than a total of 25 hours per month. Let x represent the number of hours Leah babysits and y represent the number of hours Leah works as an intern.

- A. Graph the solution set of the system of linear inequalities.
- B. Which pairs (x, y) represent hours Leah could work to meet the given conditions? Select **all** that apply.
- a. $(10, 13)$
 - b. $(4, 18)$
 - c. $(2, 18)$
 - d. $(7, 16)$
 - e. $(19, 6)$
- C. Given the conditions in Part A, if Leah babysits for 9 hours this month, what is the minimum number of hours she would have to work as an intern to earn at least \$240? Give your answer to the nearest whole hour.
- D. Given the conditions in Part A, Leah prefers babysitting over working as an intern. What is the maximum number of hours she can babysit to be able to earn at least \$240 per month? Give your answer to the nearest whole hour.