

1.  $2x - 3 = -3x + 7$

What is the value of  $x$  that satisfies the equation above?

2. If  $f(x) = 2^x$ , what is  $f(3) - f(0)$ ?

3. What is the slope of the line that passes through  $(2, 4)$  and  $(-3, 1)$ ?

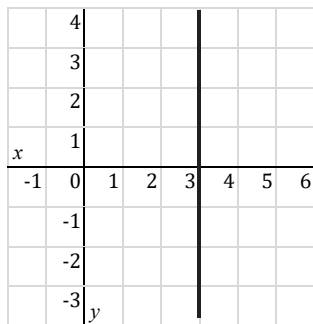
4.  $\sqrt{3} \cdot \sqrt{12x^2}$

If  $x > 0$ , simplify the expression above.

5.  $(x + 3)(x - 3) + (x - 3)^2$

Simplify the expression above in standard form.

6. Which equation is graphed below?



A)  $y = 3x$

B)  $x = 3y$

C)  $y = 3$

D)  $x = 3$

7.  $|4x + 1| = 9$

If  $a$  and  $b$  are the solutions to the equation above, what is the value of  $ab$ ?

8. A line is perpendicular to  $x + 3y = 6$  and passes through  $(1, 5)$ . Write an equation of the line in slope-intercept form.

9.  $kx - 3y = 2$

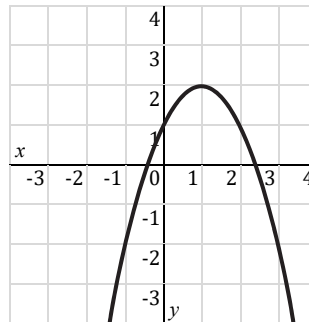
$5x + y = -1$

What value of  $k$  makes the system of equations above have no solution?

10.  $x^{-5}y^{-4} \cdot (2x^2y)^3$

Simplify the expression above using positive exponents only.

11. Write an equation in vertex form for the parabola below.



12.  $|5 - 2x| \leq 11$

What is the solution set to the inequality above?

13. If  $f(x) = x^2 - 8$  and  $f(a) = 1$ , what could be the values of  $a$ ?

14.  $4x^3 + 8x^2 - x - 2$

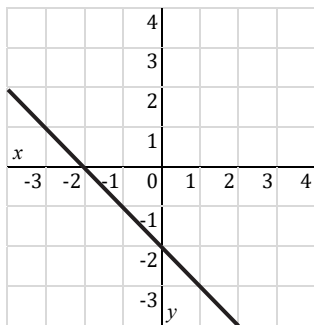
Factor the polynomial above completely.

15.  $x^2 - 2x - 2 = 0$

If  $a$  and  $b$  are the solutions to the equation above, what is the value of  $a + b$ ?

16. What is the value of  $9^{1/2} + 8^{2/3} + 81^{1/4}$ ?

17. Write an equation in slope-intercept form for the line below.



18.  $2x + y = 5$

$x - 2y = 5$

What is the solution to the system of equations above? Write your answer as an ordered pair.

19.  $4\sqrt{x+1} - 2 = 6$

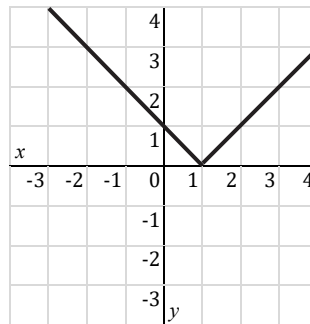
What is the solution to the equation above?

20.  $\frac{x^2 - 2x + 1}{x^2 + 2x - 3}$

Simplify the expression above. Assume all denominators are nonzero.

21. The graph of  $y = x^2 + 3x - 10$  has two  $x$ -intercepts. What is the distance between the  $x$ -intercepts?

22. Which equation is graphed below?



A)  $y = |x - 1|$

B)  $y = |x + 1|$

C)  $y = |x| - 1$

D)  $y = |x| + 1$

23.  $\frac{1}{x+2} + \frac{2}{x-3} = \frac{1}{2}$

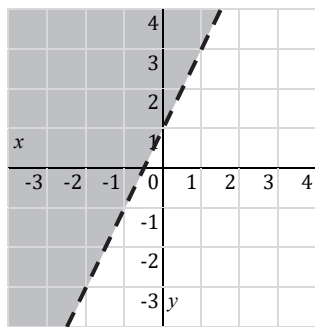
What are the solutions to the equation above?

24. The height of an object varies directly with the length of its shadow. If a tree 8 feet tall casts a shadow 10 feet long, how long will be the shadow of a tree that is 12 feet tall?

25. Owen has \$1.05 in dimes and nickels. He has 3 more dimes than nickels. How many coins of each type does he have?

26. Alex can complete a certain task in 10 hours. Working together, Alex and Eli can do it in 6 hours. How long will it take Eli alone to complete the task?

27. Write an inequality in slope-intercept form for the graph below.



28. A water tank with 300 gallons of water is emptied using two pumps. One pump pumps water out at a rate of 11 gallons and the other at a rate of 9 gallons. Write an equation in slope-intercept form that represents the amount of water,  $y$ , in the tank after  $x$  minutes.

29. Two trains leave stations 250 miles apart at the same time and travel toward each other. One train travels at 60 mph while the other travels at 65 mph. How long will it take for the two trains to meet?

30. A restaurant has 20 tables that can seat a total of 90 people. Some tables seat 4 people and the others seat 6 people. How many tables seat 4 people? How many tables seat 6 people?

31. Which table does NOT represent a linear function?

A) 

$x$	0	2	4	6	8
$y$	-7	-3	1	5	9

B) 

$x$	-2	-1	0	1	2
$y$	3	4	5	6	7

C) 

$x$	0	1	2	3	4
$y$	1	2	4	8	16

D) 

$x$	-8	-4	0	4	8
$y$	9	7	5	3	1

32. A rectangle has a perimeter of 20 inches and an area of 24 square inches. Find the dimensions of the rectangle.

33. How many liters of a 25% saline solution must be mixed with 4 liters of a 40% saline solution to make a 30% saline solution?

34. A six-sided die is thrown three times. What is the probability of getting a prime number on all three rolls?

You may use a calculator for questions 35–40. Round your answers to the nearest whole number, if necessary.

35. 5, 12, 19, 26, 33, ...

What is the 15th term of the sequence above?

36.  $h(t) = -16t^2 + 48t + 64$

A ball is thrown vertically upwards from the top of a building of height 64 feet with an initial speed of 48 feet per second. Its height  $h$ , in meters, after  $t$  seconds is given by the function above. How long will the ball be in the air before it hits the ground?

37. The hypotenuse of a right triangle is 17 cm, and one of its legs is 8 cm. What is the perimeter of the triangle?

38. During a science experiment, Lisa found that bacteria double every 20 minutes. There were 10 bacteria in the beginning. How many bacteria will be there after 3 hours?

39. A survey asked a group of teens and adults whether they prefer online shopping or in-store shopping. The table below shows the results of the survey. What percentage of the teens prefer online shopping?

	Online	In-store	Total
Teens	64	13	77
Adults	53	35	88
Total	117	48	165

40. Brian randomly arranged six textbooks on his shelf. What is the probability that math comes first? Write your answer as a fraction in simplest form.

**STOP**

This is the end of the test.  
Review your answers before grading.