

# Prep for Algebra 2 Summer Packet

## The Woodlands College Park High School

Upper level mathematics courses are designed for students to show various levels of aptitude for, interest in, and/or commitment to the study of mathematics. The courses will cover the state required curriculum in both content and depth. Each course is aligned with the College Board's recommendations and prepares students to be successful in college level courses.

- The pace of upper math courses is faster than that of the lower level math courses.
- It will be assumed that students in an algebra 2 course has mastered the material from previous math courses. In general, review of concepts that were developed in the prior mathematics courses will be imperative.
- Daily attendance and daily review of class notes are crucial for a thorough understanding of math concepts.
- Students should expect an average of 15- 30 minutes of work outside of class each day for level and an average of 30-45 minutes for honors.

CISD Course Catalog states the following:

CISD Course Catalog

Honors	Honors courses include the curriculum of the Level courses, but with a more in-depth study of the content within the course. The Honors curriculum is designed to accelerate and enrich content to prepare students for Advanced Placement, Dual Credit or for the next Honors course in that subject area. These courses require more individual initiative, analytical reading, student interaction, research, and time for outside class preparation. Students should be prepared to spend more time on homework. Honors courses are offered in English, LOTE, mathematics, social studies, science and computer science.
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- Assessments are rigorous and majority are completed without a calculator for both level and honors.
- All tests must be completed within a single class period.
- In general, there are minimal extra credit opportunities. Grades are based solely on mastery of the material.

We have found that the following criteria correlate highly with success in upper level mathematics courses:

- Near-perfect attendance.
- Exceptionally high rates of correct and reflect when making errors (metacognition) with a timely completion on daily assignments.
- Maintaining passing grades (75 and above) in current math class.
- Strong ability to work independently.
- Strong organizational and time management skills.

We expect students to have mastered the concepts from Geometry and Algebra 1 prior to the beginning of class. These concepts include, but are not limited to:

- Order of operations
- Factoring
- Solving linear and quadratic equations
- Solving systems of equations using all methods
- Writing equations of lines using all forms
- Graphing points, lines, and parabolas
- Domain and Range
- Applying laws of exponents
- Simplifying radicals
- Operations with fractions
- Multiplying polynomials
- Inequalities
- Application Problems

The attached summer packet covers the topics listed above and is designed to ensure your readiness to enter Algebra 2 next year. The Algebra 1 STAAR 2018 Released test is included in this summer packet. The class of 2022 sat for this test in May 2018. Students were permitted to use a calculator for the entire test, now you will be expected to complete the same problems WITHOUT the aid of a calculator. See how you do.

Students will be using the HP Prime graphing calculator in all Algebra 2 classes. It is suggested that you purchase this to have at home for homework assignments. Your geometry teacher has encouraged you to download the HP Prime Lite app onto your device while it has been available for free. If you have not done so already, please do so, provided the app is still free.

If you have any questions or need to refresh your memory, there are several resources available to you online.

- [www.purplemath.com](http://www.purplemath.com)
- [www.classzone.com](http://www.classzone.com)
- [www.math.com](http://www.math.com)
- Getting ready for Algebra II Video #1: [https://youtu.be/ma2fUBR2\\_Jo](https://youtu.be/ma2fUBR2_Jo)
- [www.khanacademy.com](http://www.khanacademy.com)

Please note that Khan Academy provides opportunities to practice skills with immediate feedback.

***\*This packet is required for all HONORS students and will be due the first weeks of school. First day of school is August 9, 2023. For LEVEL, the summer packet is entirely voluntary. However, it is HIGHLY SUGGESTED that students enrolled in LEVEL complete it over the summer so that they are ready for the rigor of Algebra 2!\****

Show work on ALL problems. Box your answers. All of these problems are intended to be done without the aid of a calculator.

**Key Point #1: Simplify each expression using ORDER OF OPERATIONS. PEMDAS or GEMDAS**

1)  $4^2 * 2 + [7 - (3^2 - 5)]$       2)  $[15(10) - 12(10)] \div 10$       3)  $80 \div 4 * 2 - 2 * 2$

4)  $4[(3 + 2 * 3) - 5] + 7$       5)  $(8 - 4) * (12 - 3) * \frac{1}{2}(2 + 1 * 2)$       6)  $3^2 + 7 * 2 - 8 * 2$

**Key Point #2: Simplify each algebraic expression.**

7)  $5(x + y) - 4(3x - 2y + 1)$       8)  $4w(2 - w) + 3w^2$       9)  $\frac{30x^2 + 20x - 10}{-5}$

10)  $x^2 + y^2 - [x(x + y) - y(y - x)]$       11)  $7[2 - 3(d - 4) + 4(d - 6)]$       12)  $6 - 3[3 + 3(x - 4)]$

**Key Point #3: Evaluate.**

13)  $-3x^2 + 4x$  when  $x = -2$       14)  $\frac{-2(y+1)}{16-2y^2}$  when  $y = 4$       15)  $-2b^2 + 4ab$  when  $a=3$  and  $b=-1$

**Key Point #4: Solve the following equations.**

16)  $-2(4t - 7) = 3(t - 10)$       17)  $-4(6 - 4b) = b + 21$       18)  $|4x - 3| = 6$

19)  $-4(6y - 5) = 23 - 3(8y + 1)$       20)  $5[12 - 3(2 - y) - 2y] = 2(1 - y)$       21)  $-6x^2 = -216$

22)  $\frac{5}{2}(4m + 2) = 35$       23)  $7.6r - 0.2 = 5.2r + 1$       24)  $\frac{11 - x}{3x + 2} = \frac{1}{2}$

**Key Point #5: Solve for the indicated variable. This skill supports science, as well.**

25)  $y = mx + 6$ , for  $x$

26)  $V = \pi r^2 h$ , for  $h$

27)  $A = P + Prt$ , for  $P$

28)  $A = \frac{1}{2}h(b_1 + b_2)$ , for  $h$

29)  $S = 2wL + 2Lh + 2wh$ , for  $L$

30)  $5xy + 2x = 3$ , for  $x$

**Key Point #6: Solve each quadratic equation by FACTORING.**

31)  $2x^2 - 5x + 3 = 0$

32)  $4x^2 - 100 = 0$

33)  $y^2 + 13y + 36 = 0$

34)  $a^2 + 11a = -18$

35)  $4x^2 - 4x + 1 = 0$

36a)  $3 + 6b + 3b^2 = 0$

36b)  $3x^2 - 2x - 8 = 0$

36c)  $4x^2 - 8x - 5 = 0$

**Key Point #7: Solve using the QUADRATIC FORMULA. Give answers in EXACT simplified form. (No decimals.)**

37)  $-2x^2 + 8x + 2 = 0$

38)  $2x^2 - 8x = -5$

39)  $3x^2 + 1 = 5x$

**Key Point #8: Solve the following SYSTEM OF EQUATIONS by using SUBSTITUTION.**

40)  $-7x - 7y = 0$   
 $x + 4y = 18$

41)  $-x - 7y = 4$   
 $3x + 3y = 6$

42)  $5x - y = -20$   
 $-8x + 5y = 15$

**Key Point #9: Solve the following SYSTEM OF EQUATIONS by using ELIMINATION.**

43)  $-4x - 2y = -12$   
 $4x + 8y = -24$

44)  $7x + 6y = 6$   
 $5x + 3y = -6$

45)  $7x - 9y = 17$   
 $-2x - 2y = 18$

**Key Point #10: Write each equation in SLOPE-INTERCEPT FORM.**

46)  $x - y = 2x + 3y + 9$

47)  $-2x = 24 - 8y$

**Key Point #11: Find the SLOPE and Y-INTERCEPT of each equation.**

48)  $y - 2x = 7$

49)  $y = \frac{2x + 7}{14}$

50)  $3x + 6y = 12$

**Key Point #12: Find the SLOPE of  $\overline{AB}$ .**

51) A(9, 6), B(1, 4)

52) A(-2, 2), B(4, -4)

53) A(-9, 16), B(-11, 16)

**Key Point #13: Write the SLOPE-INTERCEPT form of the equation of the line described.**

54) passes through (0, -1), and is parallel to  $y = \frac{3}{4}x - 4$

55) passes through through (1, -1) and (-1, 5)

**Key Point #14: Write the standard form ( $Ax + By = C$ ) of the equation of the line described.**

56) passes through (1, -2), slope = -5

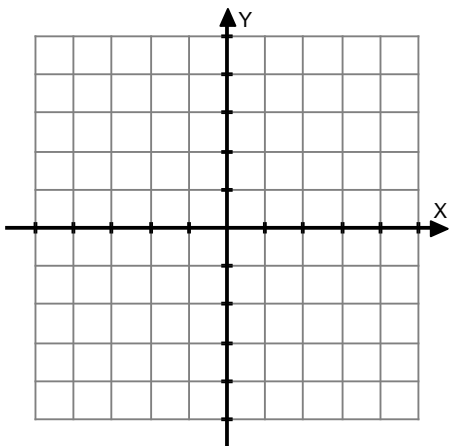
57) passes through (1, -4), slope = undefined

58) passes through (-1, -1), perpendicular to  $y = \frac{1}{2}x + 1$

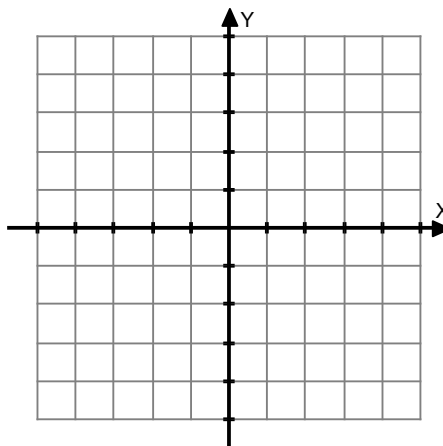
59) passes through (1, -2) and (5, 3)

**Key Point #15: Graph each of the following.**

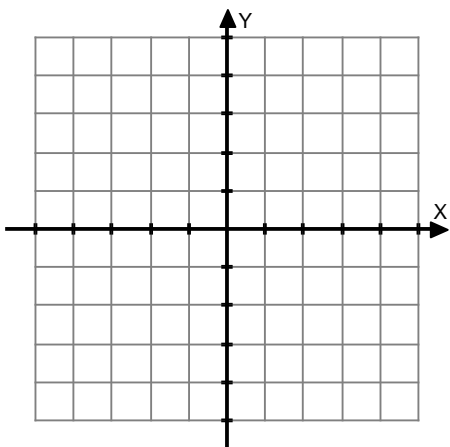
60)  $y = -2x + 4$



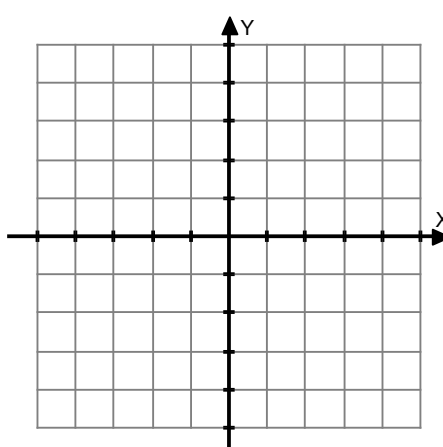
61)  $x - 2y = 0$



62)  $x = 5; y = -2$  (yes, two lines)



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



**Key Point #16: Simplify each expression. Your answers should contain only positive exponents.**

64)  $2m^2 * 2m^3$

65)  $\frac{r^2}{2r^3}$

66)  $(2x^2)^0$

67)  $(x^2y^4)^5$

68)  $(6xy^2)(-8x+9y)$

69)  $\frac{x^2y}{3y^3x^3} * \frac{18x^4}{xy^6}$

**Key Point #17: Simplify each radical. Give each answer in EXACT simplified form (No decimals).**

70)  $\sqrt{8}$

71)  $\sqrt{x^3}$

72)  $\sqrt{27m}$

73)  $\sqrt{216r^2}$

74)  $4\sqrt{10}$

75)  $\sqrt{4x^3y^4}$

76)  $\sqrt{2} * \sqrt{2}$

77)  $\sqrt{8} * \sqrt{10}$

78)  $\sqrt{32} + 3\sqrt{18} + \sqrt{2}$

**Key Point #18: Evaluate each expression. Write your answer in simplest form (REDUCE!). Where applicable, leave answers as improper fractions. Show your work.**

79)  $\frac{1}{3} \left( \frac{5}{6} - \frac{3}{4} + \frac{2}{3} \right)$

80)  $\frac{\frac{3}{9} - \frac{8}{12}}{\frac{3}{8} * 2}$

81)  $-\frac{4}{9} * \frac{3}{2} - \frac{5}{6} + 3$

82)  $(4 - \frac{5}{6} + 3 * 2) \div \frac{5}{6}$

83)  $\frac{\frac{2}{3} + 4}{\frac{5}{6}}$

84)  $\frac{\frac{3}{2} + \frac{3}{4} + \frac{3}{8}}{21}$

**Key Point #19: Multiply the following polynomials**

85)  $(3x-2)(x-1)$

86)  $(2x-9)(3x-8)$

87)  $(-3k-4)(-k-4)$

88)  $(3x-5)^2$

89)  $(5x-3y)(5x+3y)$

90)  $(8a^3+2b)^2$

**Key Point #20: Solve the following inequalities**

91)  $x + 6 \geq 2(1 - x)$

92)  $-2x + 3 < x - 6$

93)  $-2 \leq 4x + 6 \leq 22$

**Key Point #21: Application Problems**

- 94) A lamppost casts a shadow that is 24 feet long. Tad, who is 6 feet tall, is standing directly next to the lamppost. His shadow is 15 feet long. How tall is the lamppost?
- 95) A locksmith charges \$25 to make a house call and \$15 for each lock that is re-keyed. Another locksmith charges \$10 to make a house call and \$20 for each lock that is re-keyed. For how many locks will the total costs be the same?
- 96) A popular mixture of potpourri includes pine needles and lavender. If pine needles cost \$1.50 per ounce and lavender costs \$4.00 per ounce, how much of each ingredient should be mixed to make 80 oz of the potpourri that is worth \$200?
- 97) A passenger plane made a trip to Las Vegas and back. On the trip there it went 432 mph and on the return trip it went 480 mph. How long did the trip to Las Vegas take if the return trip took 9 hours?
- 98) Ryan left the science museum and drove south. Gabriella left the science museum three hours later driving 42 km/h faster than Ryan in an effort to catch up to him. After two hours Gabriella finally caught up. Find Ryan's average speed.
- 99) How many mg of a metal containing 45% nickel must be combined with 6 mg of pure nickel to form an alloy containing 78% nickel?
- 100) From 1980 through 1990, the prize money,  $P$  (in \$1000's) for the singles champions at the U.S. Tennis Open can be modeled by  $P = 30.2t + 35.8$  where  $t = 0$  represents 1980. According to the is model, when will the prize money be \$500,000?



**2018 Spring STAAR Algebra 1 Test (this is the test that all class of 2022 took in May 2018)**  
**You will be expected to complete all of these WITHOUT the aid of a calculator.**

- 1** At a restaurant jars of tomato sauce are stored in boxes in the pantry. Each box contains 8 jars of tomato sauce. A cook uses 2 jars from 1 of the boxes.

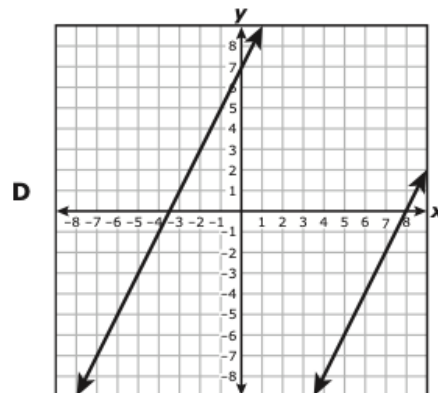
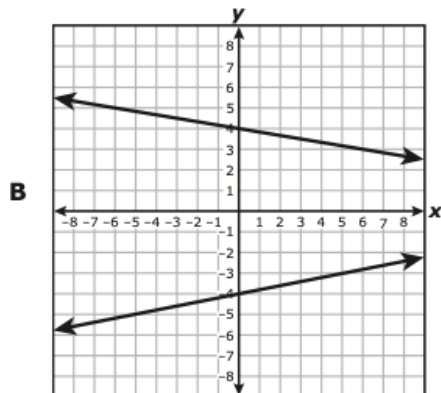
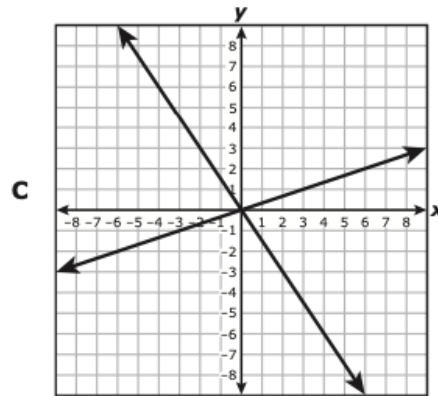
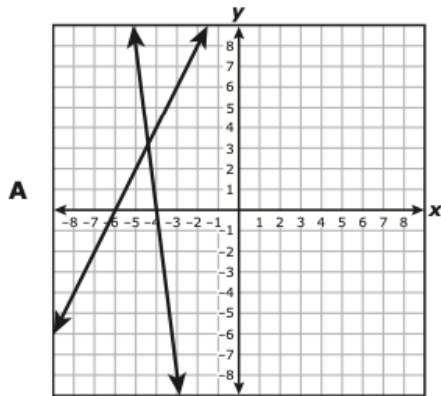
Which function shows the relationship between  $y$ , the total number of jars of tomato sauce remaining in the pantry, and  $x$ , the number of boxes in the pantry?

- A**  $y = 8x + 6$
- B**  $y = 8x$
- C**  $y = 8x - 2$
- D**  $y = 6x$

- 2** Which expression is equivalent to  $-28x^2 + 35x$ ?

- F**  $7x(4x + 5)$
- G**  $-7x(4x - 5)$
- H**  $7x(4x - 5)$
- J**  $-7x(4x + 5)$

- 3** Which graph best represents a system of equations that has no solution?



4 Which statement about the graph of  $y = 8(0.25)^x$  is true?

F The coordinates of the  $x$ -intercept are  $(0.25, 0)$ .

G The coordinates of the  $y$ -intercept are  $(0, 8)$ .

H The equation of the asymptote is  $x = 0$ .

J The graph includes the point  $(2, 1)$ .

5 What is the range of  $y = -x^2 - 2x + 3$ ?

A  $x \leq 4$

B  $x \geq -4$

C  $y \leq 4$

D  $y \geq -4$

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6 Which expression is equivalent to  $(144k^2r^{14})^{\frac{1}{2}}$  for all positive values of  $k$  and  $r$ ?

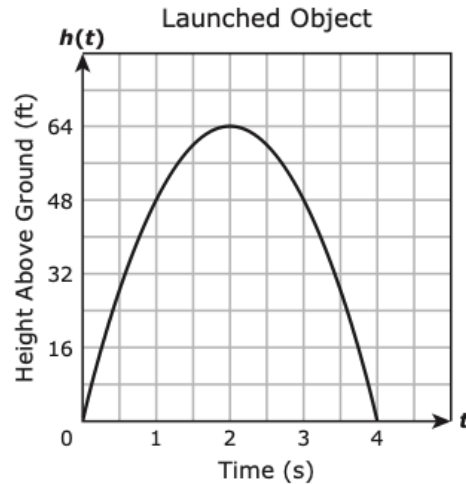
F  $12kr^7$

G  $72k^2r^{14}$

H  $144kr^7$

J  $12k^2r^{14}$

- 7 The graph shows the height in feet of an object above the ground  $t$  seconds after it was launched from the ground.



Which function is best represented by the graph of this situation?

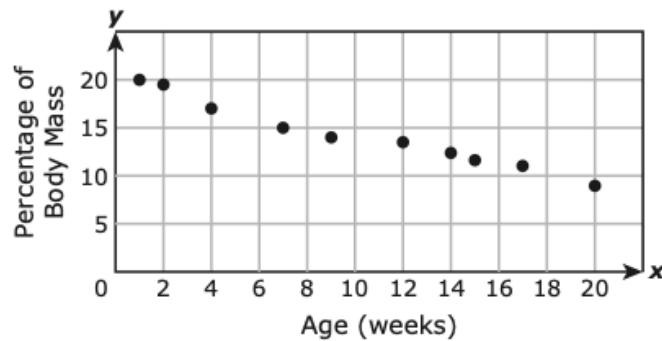
- A**  $h(t) = -16t^2 - 64t$
- B**  $h(t) = -16t^2 + 128t - 256$
- C**  $h(t) = -16t^2 + 64t$
- D**  $h(t) = -16t^2 - 128t - 256$
- 8 What value of  $n$  makes the equation  $4(0.5n - 3) = n - 0.25(12 - 8n)$  true?
- 9 In a sequence of numbers,  $a_3 = 0$ ,  $a_4 = 6$ ,  $a_5 = 12$ ,  $a_6 = 18$ , and  $a_7 = 24$ . Based on this information, which equation can be used to find the  $n^{\text{th}}$  term in the sequence,  $a_n$ ?
- A**  $a_n = -6n + 18$
- B**  $a_n = -18n + 6$
- C**  $a_n = 6n - 18$
- D**  $a_n = 18n - 6$
- 10 The value of  $y$  varies directly with  $x$ . If  $x = 3$ , then  $y = 21$ . What is the value of  $x$  when  $y = 105$ ?

11. What is the factored form of  $x^2 - 17x - 60$  ?

- 12 A zookeeper recorded the feeding schedule for a baby rhinoceros for 20 weeks. The table and scatterplot show the percentage of the baby rhinoceros's body mass that was used to determine the amount of food given at each feeding as a linear function of its age in weeks.

Baby Rhinoceros Feeding Schedule

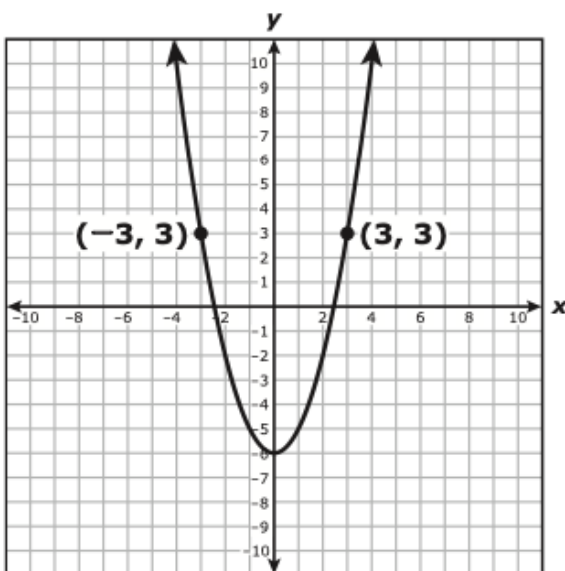
Age (weeks)	1	2	4	7	9	12	14	15	17	20
Percentage of Body Mass	20	19.5	17	15	14	13.5	12.4	11.6	11	9



What is the best prediction of the percentage of the baby rhinoceros's body mass that should be used to determine the amount of food given at each feeding when it is 25 weeks old?

- F 8.5%
  - G 6%
  - H 2.5%
  - J 10%
- 13 What are the domain and range of  $f(x) = -37$ ?
- A Domain: All real numbers greater than or equal to  $-37$   
Range: All real numbers
  - B Domain:  $\{-37\}$   
Range: All real numbers
  - C Domain: All real numbers  
Range: All real numbers greater than or equal to  $-37$
  - D Domain: All real numbers  
Range:  $\{-37\}$

14 The graph of quadratic function  $p$  is shown on the grid.



If  $k(x) = x^2$  and  $p(x) = k(x) + n$ , what is the value of  $n$ ?

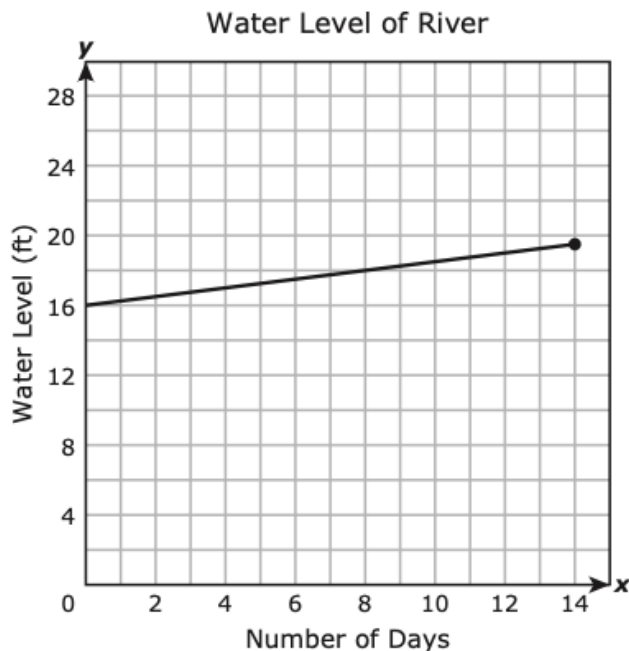
Record your answer and fill in the bubbles on your answer document.

- 15 Two customers went to a post office to buy postcards and large envelopes. Each postcard costs the same amount, and each large envelope costs the same amount.
- The first customer paid \$12 for 14 postcards and 5 large envelopes.
  - The second customer paid \$24.80 for 10 postcards and 15 large envelopes.

What was the cost in dollars of each large envelope?

- A \$1.42
- B \$0.35
- C \$1.15
- D \$0.63

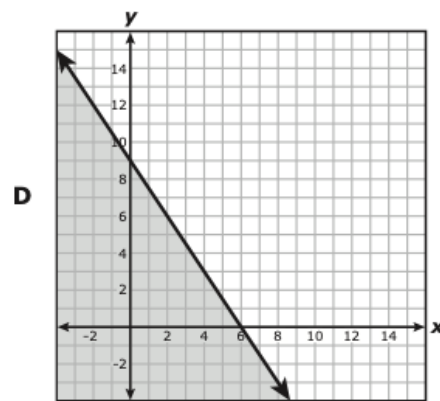
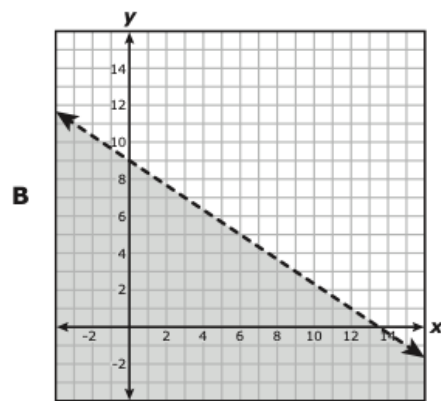
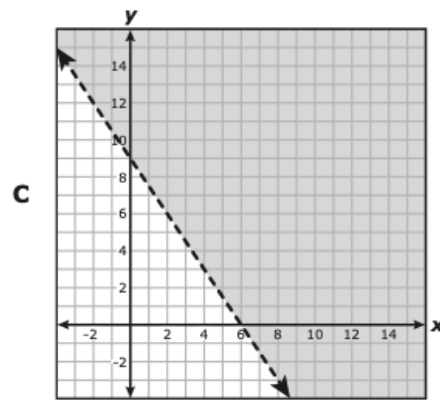
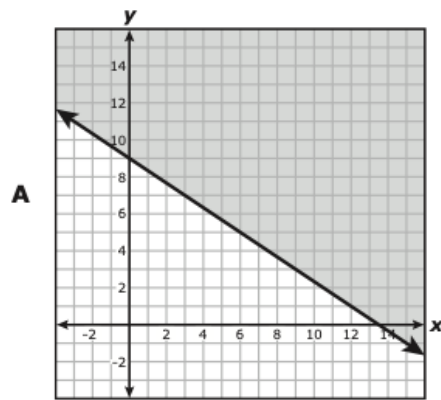
- 16 The water level of a river was measured each day during a two-week period. The graph models the linear relationship between the water level of the river in feet and the number of days the water level was measured.



Which statement best describes the  $y$ -intercept of the graph?

- F** The water level increased by 0.25 ft per day.
- G** The maximum water level was 19.5 ft.
- H** The initial water level was 16 ft.
- J** The water level was measured for 14 days.
- 17 There are 1,024 players in a tennis tournament. In each round, half the players are eliminated. Which function can be used to find the number of players remaining in the tournament at the end of  $x$  rounds?
- A**  $f(x) = 1,024(1.50)^x$
- B**  $f(x) = 1,024(0.50)^x$
- C**  $f(x) = 1,024(1.05)^x$
- D**  $f(x) = 1,024(0.05)^x$
- 18 Which statement about  $g(x) = x^2 - 576$  is true?
- F** The zeros,  $-288$  and  $288$ , can be found when  $0 = (x + 288)(x - 288)$ .
- G** The only zero,  $288$ , can be found when  $0 = (x - 288)^2$ .
- H** The zeros,  $-24$  and  $24$ , can be found when  $0 = (x + 24)(x - 24)$ .
- J** The only zero,  $24$ , can be found when  $0 = (x - 24)^2$ .

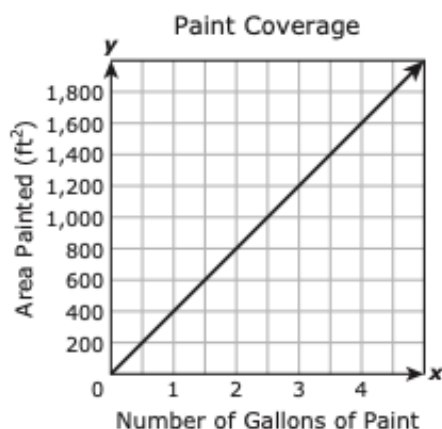
19 Which graph best represents the solution set of  $-4x \leq 6y - 54$ ?



20 Given  $f(x) = \frac{1}{3}(4 - x)^2$ , what is the value of  $f(16)$ ?

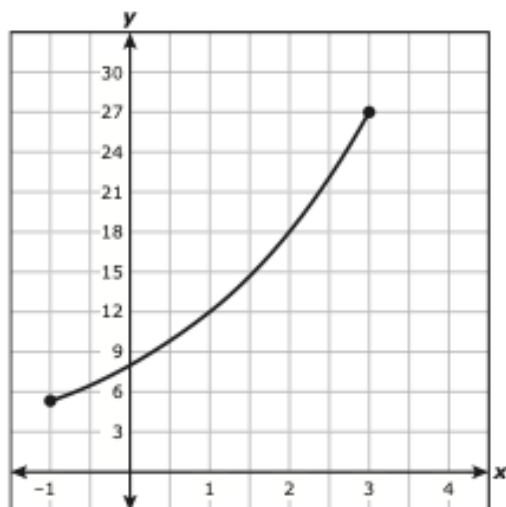
Record your answer and fill in the bubbles on your answer document.

- 21 The graph shows the linear relationship between the maximum area in square feet that can be painted and the number of gallons of paint used.



Which of these best represents the rate of change of the maximum area painted with respect to the number of gallons of paint used?

- A 200 ft<sup>2</sup>/gal
- B  $\frac{1}{200}$  ft<sup>2</sup>/gal
- C 400 ft<sup>2</sup>/gal
- D  $\frac{1}{400}$  ft<sup>2</sup>/gal
- 22 What are the solutions to  $(x + 7)^2 = 81$ ?
- 23 What appears to be the domain of the part of the exponential function graphed on the grid?





- 24 The tables of ordered pairs represent some points on the graphs of lines  $q$  and  $v$ .

Line $q$				Line $v$			
$x$	-9	-3	2	$x$	-4	0	10
$y$	0	18	33	$y$	10	8	3

Which system of equations is represented by lines  $q$  and  $v$ ?

- F**  $21x - y = 9$   
 $5x + 6y = 40$
- G**  $3x - y = -27$   
 $x + 2y = 16$
- H**  $21x - y = 9$   
 $5x + 6y = 20$
- J**  $9x - y = -27$   
 $x + 2y = 8$

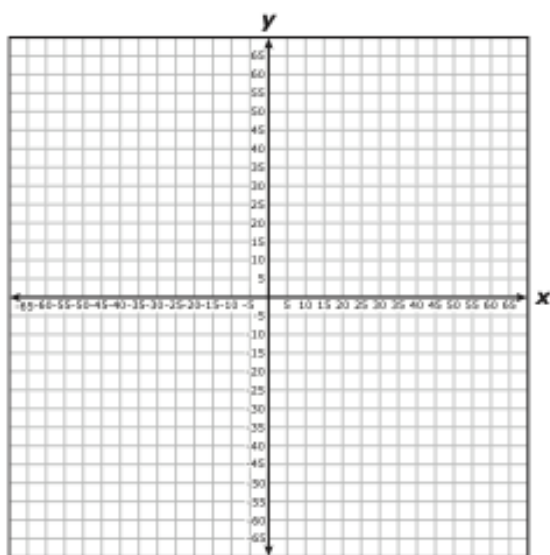
- 25 Which situation does NOT show causation?

- A** When the student population at a school increases, the number of teachers at the school increases.
- B** When the amount of sugar in a quart of apple juice is reduced, there are fewer calories in each serving.
- C** When there are more workers on a project, the project is completed in less time.
- D** When there is more protein in an athlete's diet, the athlete scores more points in a game.

- 26 Which function is equivalent to  $f(x) = -4(x + 7)^2 - 6$ ?

- F**  $f(x) = -4x^2 - 56x - 202$
- G**  $f(x) = -4x^2 + 14x + 43$
- H**  $f(x) = -4x^2 - 56x - 172$
- J**  $f(x) = -4x^2 + 190$

- 27** A paper airplane was thrown from the top of a tall building. The height of the paper airplane above the ground can be found using the function  $y = -1.5x + 60$ , where  $x$  is the time in seconds the airplane has been in the air.



How many seconds did it take the paper airplane to reach the ground?

Record your answer and fill in the bubbles on your answer document.

- 28** Which expression is equivalent to  $\frac{(q^4)^{-3}}{q^{-15}}$  for all values of  $q$  where the expression is defined?

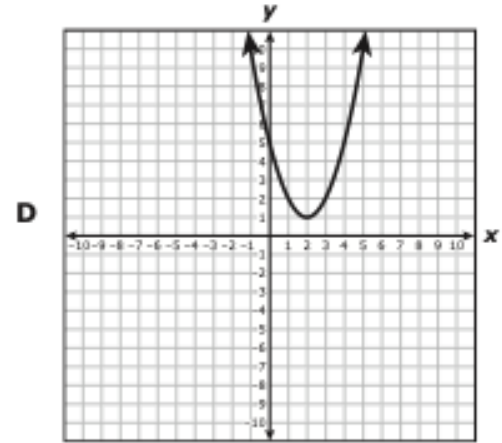
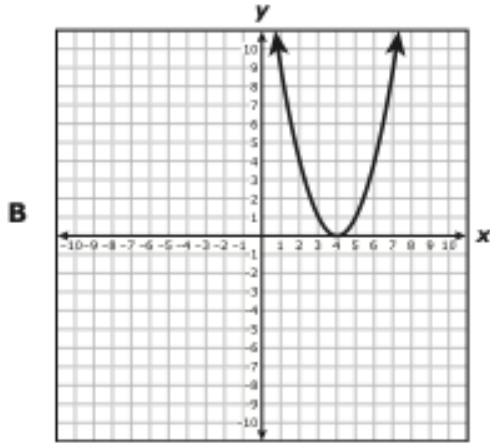
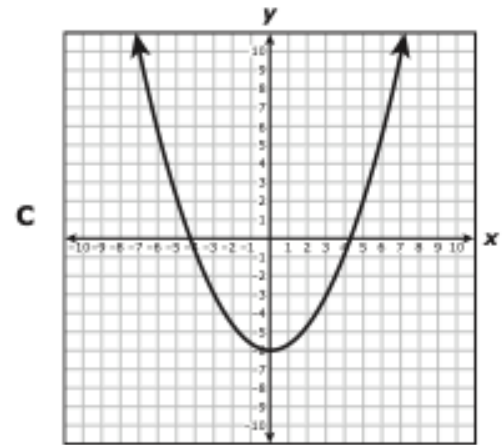
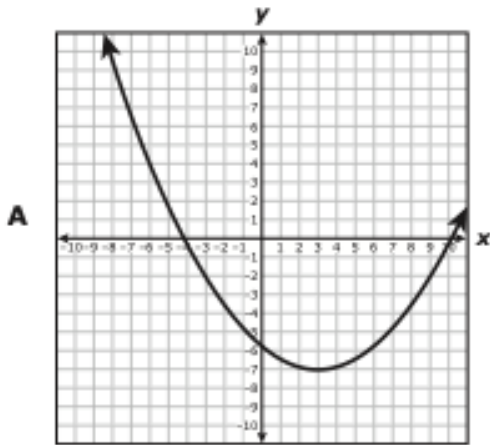
**F**  $q^{27}$

**G**  $\frac{1}{q^{27}}$

**H**  $q^3$

**J**  $\frac{1}{q^3}$

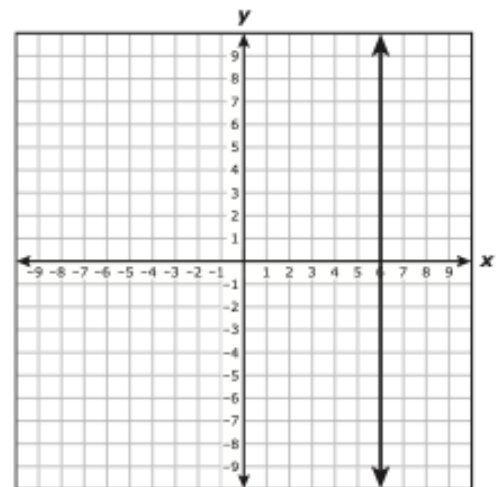
29 Which graph best represents a quadratic function that has only one zero?



30 What is the solution set for  $-4x + 10 \geq 5x + 55$ ?

31. What are the factors of  $21x^2 + 13x - 20$ ?

32. What are the equation and slope of the line shown on the grid?

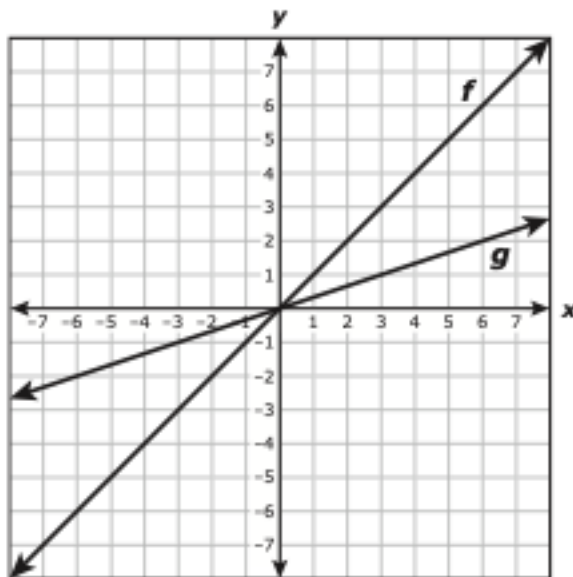


- 33** In the year 1900, the total number of metric tons of copper produced in the world was 495,000. Each year since 1900, the total number of metric tons of copper produced has increased on average by about 3.25% over the amount produced the previous year.

Which function models the total number of metric tons of copper produced in the year that is  $x$  years since 1900?

- A**  $c(x) = 495,000(1.0325)^x$
- B**  $c(x) = 495,000(0.9675)^x$
- C**  $c(x) = 495,000x^{1.0325}$
- D**  $c(x) = 495,000x^{0.9675}$
- 34** What is the solution to  $34x + 95 = 3(14x + 9)$ ?

- 35** The graphs of linear functions  $f$  and  $g$  are shown on the grid.



Which function is best represented by the graph of  $g$ ?

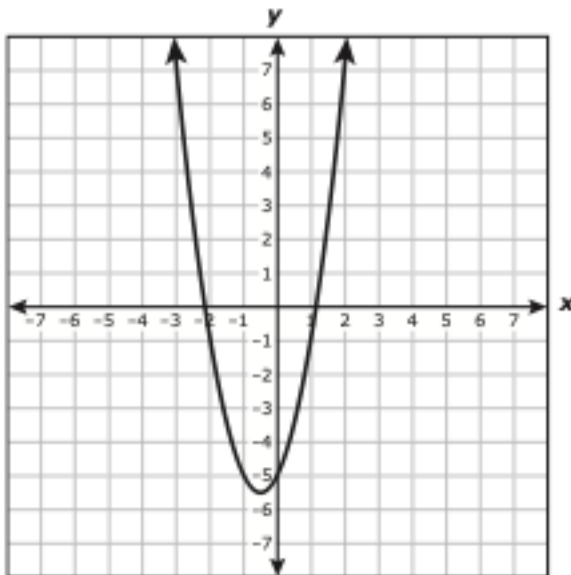
- A**  $g(x) = f(x) - 4$
- B**  $g(x) = \frac{1}{3}f(x)$
- C**  $g(x) = f(x) - 2$
- D**  $g(x) = 3f(x)$

36. Multiply  $(h^2 + 9h - 1)(-4h + 3)$

- 37** There are 15 plates in a kitchen cabinet. The diameter of each plate is either 7 inches or 12 inches. The diameter of all 15 plates combined is 140 inches.

Write a system of equations which can be used to find the number of 7-inch plates,  $x$ , and the number of 12-inch plates,  $y$ , that are in the cabinet?

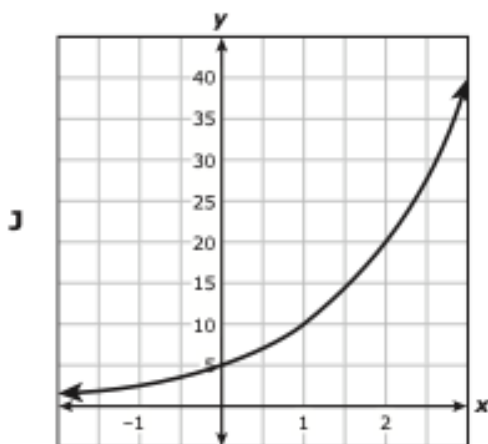
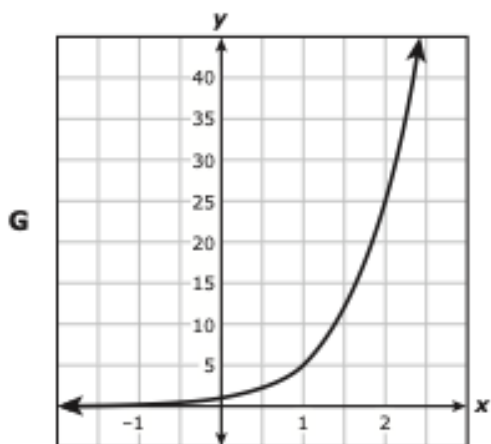
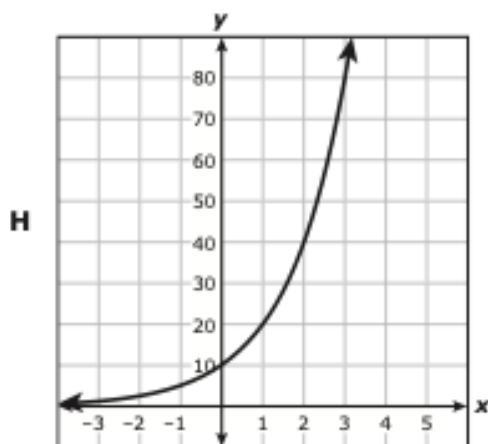
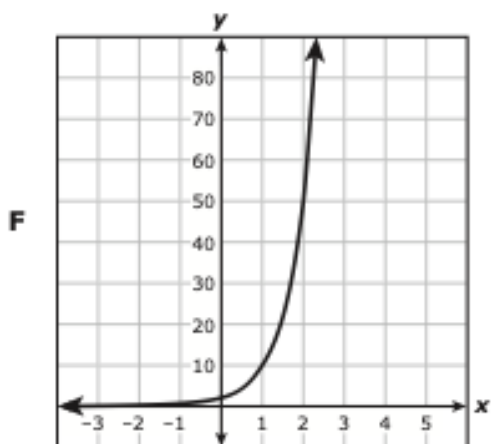
- 38** The graph of quadratic function  $f$  is shown on the grid.



What is the domain of function  $f$ ?

- 39** What is the equation in slope-intercept form of the line that passes through the point  $(2, -2)$  and is perpendicular to the line represented by  $y = \frac{2}{5}x + 2$ ?

40 Which graph best represents  $f(x) = 2(5)^x$ ?



41 The area of a rectangular trampoline is  $112 \text{ ft}^2$ . The length of the trampoline is 6 ft greater than the width of the trampoline. This situation can be represented by the equation  $w^2 + 6w - 112 = 0$ .

What is the width of the trampoline in feet?

42 The table shows the linear relationship between the balance of a student's savings account and the number of weeks he has been saving.

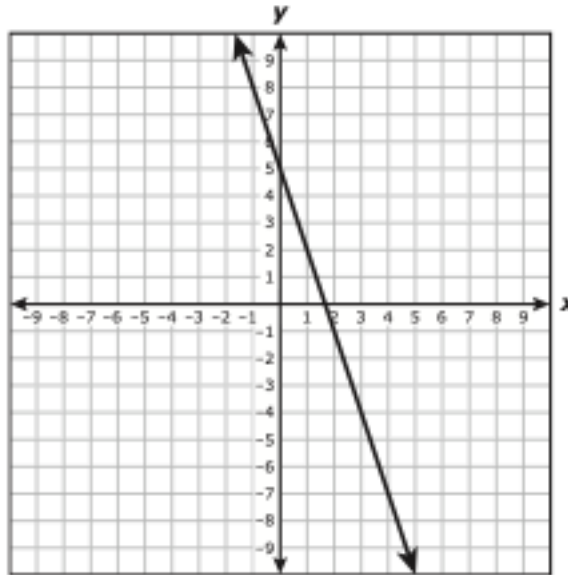
Savings Account

Week	0	1	3	6	8	13
Balance (dollars)	32	39	53	74	88	123

Based on the table, what was the rate of change of the balance of the student's savings account in dollars and cents per week?

Record your answer and fill in the bubbles on your answer document.

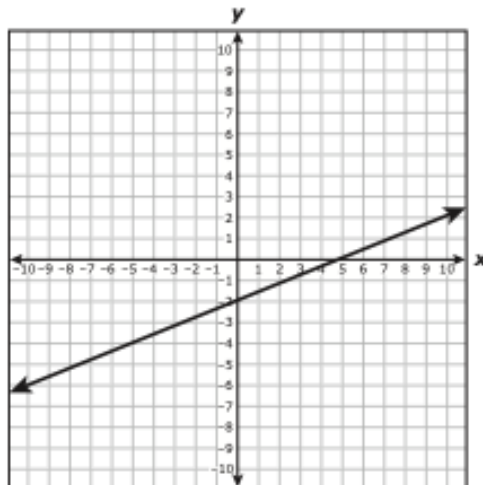
43 The graph of a linear function is shown on the grid.



What is the equation of this line in slope-intercept form?

44. What are the factors of  $9r^2 - 4r + 1$ ?

45 The graph of  $2x - 5y = 10$  is shown on the grid.



Which ordered pair is in the solution set of  $2x - 5y \geq 10$ ?

- A (0, 5)
- B (5, 0)
- C (-2, 5)
- D (-5, 2)

- 46** Scientists are studying a bacteria sample. The function  $f(x) = 245(1.12)^x$  gives the number of bacteria in the sample at the end of  $x$  days.

Which statement is the best interpretation of one of the values in this function?

- F** The initial number of bacteria is 12.
  - G** The initial number of bacteria decreases at a rate of 88% each day.
  - H** The number of bacteria increases at a rate of 12% each day.
  - J** The number of bacteria at the end of one day is 245.
- 

- 47** The daily cost of hiring a plumber,  $y$ , to work  $x$  hours on a repair project can be modeled using a linear function. The plumber charges a fixed cost of \$80 plus an additional cost of \$45 per hour. The plumber works a maximum of 8 hours per day.

For one day of work, what is the range of the function for this situation?

- A**  $0 \leq x \leq 8$
  - B**  $80 \leq y \leq 440$
  - C**  $0 \leq x \leq 10$
  - D**  $45 \leq y \leq 685$
- 

- 48** The graph of  $g(x) = x^2$  was transformed to create the graph of  $h(x) = -\left(\frac{x}{4}\right)^2$ . Which of these

describes the transformation from the graph of  $g$  to the graph of  $h$ ?

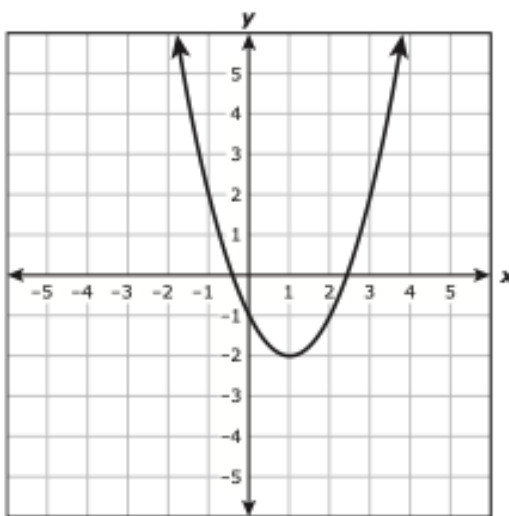
- F** A reflection over the  $x$ -axis and a horizontal stretch
- G** A reflection over the  $y$ -axis and a horizontal stretch
- H** A reflection over the  $x$ -axis and a vertical stretch
- J** A reflection over the  $y$ -axis and a vertical stretch



49 Which expression is equivalent to  $\frac{10q^5w^7}{2w^3} \cdot \frac{4(q^6)^2}{w^{-5}}$  for all values of  $q$  and  $w$  where the expression is defined?

- A  $\frac{32q^7}{w}$
  - B  $20q^{17}w^9$
  - C  $32q^7w^9$
  - D  $20qw$
- 

50 A graph of a quadratic function is shown on the grid.



Which coordinates best represent the vertex of the graph?

- F (2.4, 0)
- G (0, -1)
- H (-0.4, 0)
- J (1, -2)

51 What is the slope of the line that passes through the points (5, -11) and (-9, 17)?

52 What is the x-value of the solution to this system of equations?

$$\begin{aligned}x &= 2y - 4 \\ 7x + 5y &= -66\end{aligned}$$

53. What is the simplified expression of  $\sqrt{96}$ ?

54 Which line appears to have an x-intercept of -5 and a y-intercept of 3?

