CHANNEL VIEW

An Expeditionary Learning School

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June 2018
Entering 302 and 402

Dear Parents:

In our effort to academically prepare your child for the coming school year, the math teachers at Channel View School for Research have prepared a math packet for the summer vacation to help your child reinforce and maintain his/her math skills.

Students are expected to complete all assigned work in the packet. Parents are asked to certify that their child completed the assignment. The math packet will be collected, scored, and reviewed in class. The completed math packet is due to your child's math teacher on the first day of school, **<u>Wednesday, September 5, 2018</u>**.

Working together we can insure maximum success for your child. Your cooperation in this matter is appreciated.

We wish you a happy and healthy summer.

Sincerely,

Mrs. Harper-Richardson
Principal
_____

I certify that my child has completed the required 2018 Summer Vacation Math Assignment.

Student's Name _____ Entering Grade _____

Parent's Signature _____ Date _____

Student _____

Class _____

Date _____

1. What is the solution of

   $\dfrac{4}{9}(x - 7) = -8$

   A. x = -11   C. x = -25

   B. x = 25   D. x = 11

2. Which shows $4^6 \div 4^5$ in standard form?

   A. 0   C. 4

   B. 1   D. 16

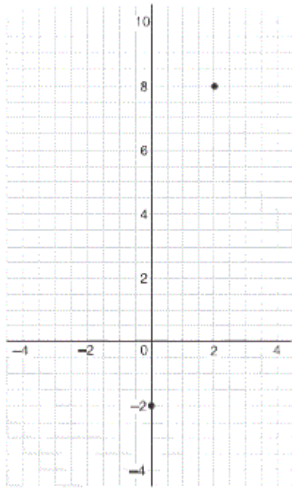3. Which shows $6^{-1} \div 6^{-4}$ in exponential form?

   A. 6^{-5} C. 6^1

   B. 6^{-3} D. 6^3

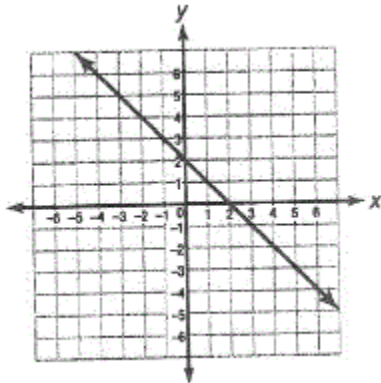4. If a line passes through the two points below, the equation of the line is:

A. $y = -2x + 5$

C. $y = 5x - 2$

B. $y = 2x - 5$

D. $y = -5x - 2$

5. Which equation best represents the line graphed below?

A. $y = -2x + 1$

C. $y = x + 2$

B. $y = -x + 2$

D. $y = 2x - 1$

6. Jake works two jobs after school. He works at his neighbor's yard and also at a retail store. Both jobs pay Jake at an hourly rate. On Monday, Jake worked for 2 hours at the yard and 3 hours at the retail store and earned a total of $49.00. On Tuesday, he worked for 1 hour at the yard and 2 hours at the retail store and earned a total of $30.00. How much did Jake earn per hour at each job?

A. neighbor's yard's hourly rate = $11.00 per hour, retail store's hourly rate = $8.00 per hour

C. neighbor's yard's hourly rate = $10.00 per hour, retail store's hourly rate = $9.00 per hour

B. neighbor's yard's hourly rate = $8.00 per hour, retail store's hourly rate = $11.00 per hour

D. neighbor's yard's hourly rate = $10.00 per hour, retail store's hourly rate = $10.00 per hour

7. Which best describes the solution for $\frac{g}{2} - 6 = 4$?

A. $g = 20$

C. no solution

B. $g = 5$

D. infinitely many solutions

8. Which expression is equivalent to $6^{-4} \div 6^{-2}$?

A. 6^{-6}

C. 6^{2}

B. 6^{-2}

D. 6^{8}

9. An industrial machine creates $4^3 \cdot 4^5$ products every year. How many products does the machine create each year?

A. 4

C. 64

B. 16

D. 65,536

10. Heidi paid $18 for 7 pairs of socks. She bought wool socks that cost $3 per pair and cotton socks that cost $2 per pair. How many pairs of each type of socks did she buy?

A. 2 pairs of wool and 5 pairs of cotton

C. 4 pairs of wool and 3 pairs of cotton

B. 3 pairs of wool and 4 pairs of cotton

D. 5 pairs of wool and 2 pairs of cotton

11. The graph below shows the amount of water, in gallons, that flows out of different types of showerheads in x minutes.

Showerhead Speeds
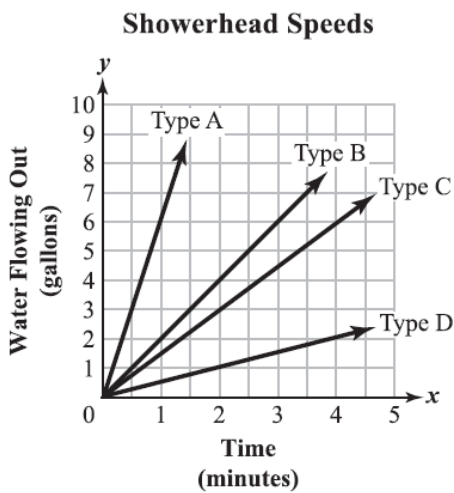
Through which type of showerhead does water flow out at a rate of 2 gallons per minute?

A. Type A

C. Type C

B. Type B

D. Type D

12. In the figure below, $\triangle PSQ$ is similar to $\triangle QTR$
. Which of these statements is correct when comparing the slope of $\overline{PQ}$ and the slope of $\overline{QR}$?
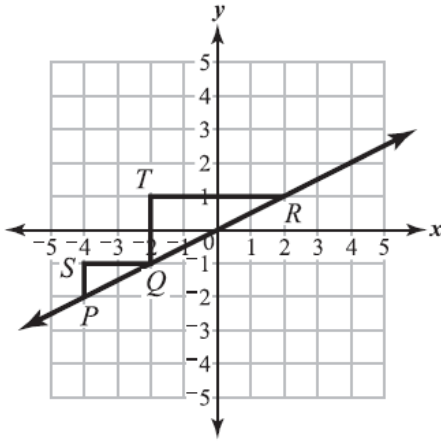
A. $\overline{QR}$ and $\overline{PQ}$ both have a slope of 2.

C. $\overline{QR}$ has a slope of 4, $\overline{PQ}$ has a slope of 2, and $4 > 2$
.

B. $\overline{QR}$ and $\overline{PQ}$ both have a slope of $\frac{1}{2}$.

D. $\overline{QR}$ has a slope of $\frac{2}{4}$, $\overline{PQ}$ has a slope of $\frac{1}{2}$, and $\frac{2}{4} > \frac{1}{2}$.

13. What is the solution of $5(x + 2) = 27$?

A. $x = -\dfrac{37}{5}$

C. $x = -\dfrac{17}{5}$

B. $x = \dfrac{37}{5}$

D. $x = \dfrac{17}{5}$

14. What is the value of y in this equation $y - 14 = -6$?

A. -20

C. 8

B. -8

D. 20

15. What is the solution to the system of linear equations shown below?

$$4x + 7y = 10$$
$$4x + 7y = -1$$

A. There are infinitely many solutions because both lines have a slope of $-\frac{4}{7}$.

C. There is no solution because $4x + 7y$ cannot equal 10 and -1 simultaneously.

B. The solution is (0, 11) as determined by subtracting the equations.

D. The solution is (10, -1) based on the y-intercepts of the lines.

16. Which equation can you use to solve the systems of equations shown?

$$\begin{cases} -4x + y = 3 \\ 11x - 5y = 16 \end{cases}$$

A. $11(4x + 3) - 5y = 16$

C. $-4(11x - 5y) = 3$

B. $11x - 5(4x + 3) = 16$

D. $-4x + 16 - 11x = 3$

17.

What is the value of $\dfrac{4^8}{4^6}$?

A. 8

C. 32

B. 16

D. 64

18. An engineer records the number of centimeters the water levels rise in two reservoirs during a controlled closing of a dam. After 2 hours, the water level in Reservoir A increases by 8 centimeters. The water level change in Reservoir B is represented by the equation $y = 8x$, where y represents the water level in centimeters and x represents hours.

Both reservoirs rise at a constant rate. Which statement correctly compares the rise of water in both reservoirs?

A. The water level in Reservoir B rises 2 times the rate of Reservoir A.

C. The water level in Reservoir A rises 4 times the rate of Reservoir B.

B. The water level in Reservoir A rises 2 times the rate of Reservoir B.

D. The water level in Reservoir B rises 8 times the rate of Reservoir A.

19. The distance between two stars is 9.0×10^{-3} light years. A light year is equal to 5.88×10^{12} miles. What is the distance, in miles, between the two stars?

A. 1.488×10^{10} miles

C. 1.488×10^{16} miles

B. 5.292×10^{10} miles

D. 5.292×10^{16} miles

20. A head of a pin has a diameter of 1×10^{-4} meter. A bacterium has a diameter of 5×10^{-7} meter. How many bacteria that size would fit across the diameter of the pinhead?
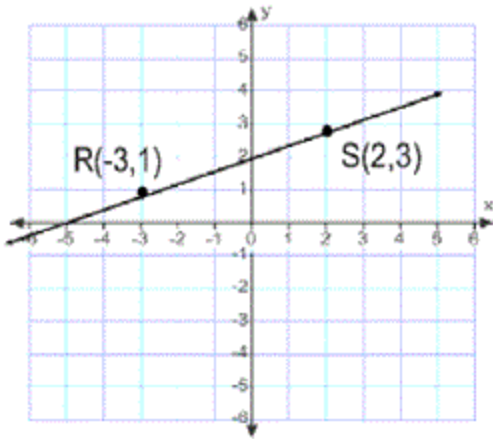
A. 2

C. 200

B. 20

D. 2×10^{11}

21. What is the slope of the line that passes through points R and S?

A. $-\dfrac{5}{2}$

B. $-\dfrac{2}{5}$

C. $\dfrac{2}{5}$

D. $\dfrac{5}{2}$

22. Mariana is 10 years old and has grown 7 inches in 2 years. When she was 8 years old, she was 52 inches tall and began recording her height. Mariana writes and graphs a function that models her height in inches over time in years. What is the initial value for this function?

A. 59

B. 3.5

C. 7

D. 52

23. Which set of ordered pairs does **not** represent a function?

A. {(-6, 9), (-3, 3), (0, 3), (3, 9)}

B. {(-2, 2), (-4, 2), (-6, 2), (-8, 2)}

C. {(5, -1), (-1, 5), (5, 1), (1, -5)}

D. {(10, -10), (5, -5), (-5, 5), (-10, 10)}

24. Which of these tables represents a linear function expressed by $y = {}^-9x + 21$?

A.

x	y
2	1
4	13
6	33
8	61

C.

x	y
1	12
2	3
3	−6
4	−15

B.

x	y
1	−8
3	2
4	25
6	137

D.

x	y
0	1
3	10
6	37
9	82

25.

For Function 1, any y-value can be determined by using the expression: $\dfrac{5}{2}x + 3$

The table below represents Function 2.

x	−1	0	1	2	3
y	−1	3	7	11	15

Which statement about the two functions is true?

A. Both functions have the same rate of change.

C. Function 2 has a greater rate of change than Function 1.

B. Function 1 has a greater rate of change than Function 2.

D. Function 1 has a positive rate of change, and Function 2 has a negative rate of change.

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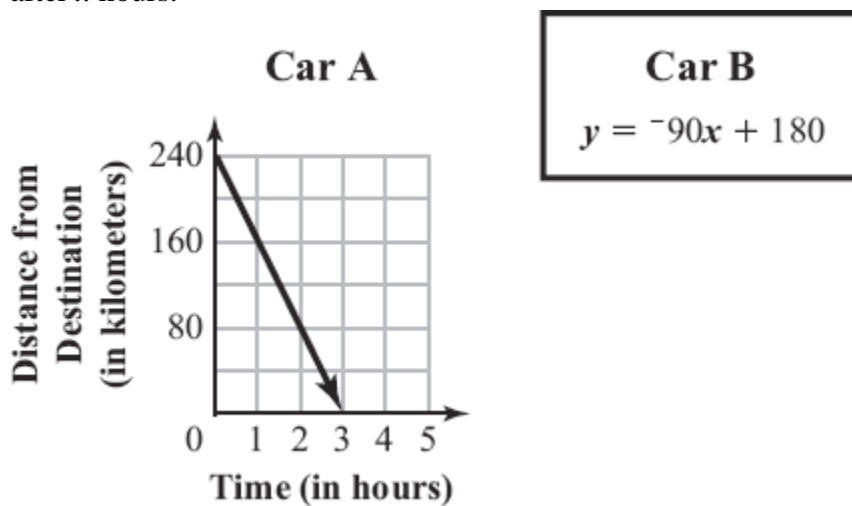26. Which equation represents a linear function?

A. $y = 8x^4$

C. $y = 2x^2 + 5$

B. $y = -0.05x - 0.001$

D. $y = \sqrt[3]{x}$

27. This graph and equation each show the distances y, in kilometers, of two different cars from a destination after x hours.

Car A

Car B

$y = {}^-90x + 180$

What is the difference between the cars' initial distance, in kilometers, from their destination?

A. 10 kilometers

C. 170 kilometers

B. 60 kilometers

D. 180 kilometers

28. Which set of ordered pairs represents a function?

A. (-2,1), (0,1), (1,-2), (3,4)

C. (12,36), (9,27), (-6,30), (9,18)

B. (-1,5), (-2,3), (-2,1), (-3,1)

D. (3,17), (-2,11), (1,8), (3,5)

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29. What is the equation for the rule of the pattern in the table below?

x	y
1	3
4	18
7	51
10	102

A. $y = x^2 + 1$

C. $x = y^2 - 1$

B. $y = x^2 + 2$

D. $x = y^2 + 2$

30. What equation could be written for this table?

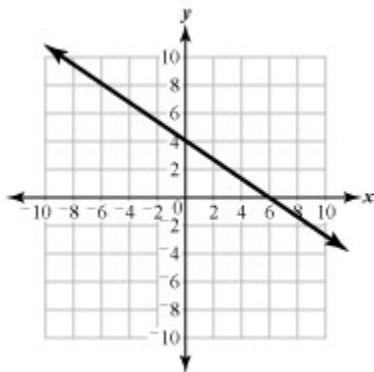| x	0	1	2	3
y	-1	-5	-9	-13

A. $y = -4x$

C. $y = -2x - 1$

B. $y = -4x - 1$

D. $y = -1 + 6x$

31. An online calculator generates different output values of y for different input values of x, as shown in the graph below. Which of these equations can be used to generate the output values?
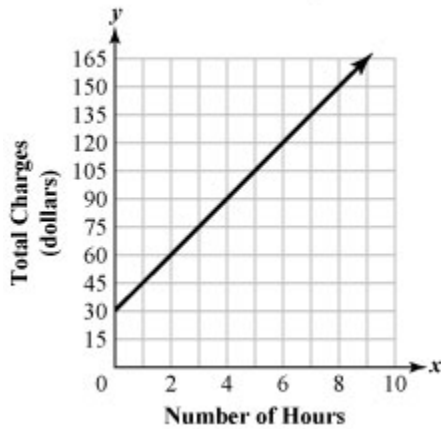

A. $y = \frac{2}{3}x + 4$

C. $y = -\frac{2}{3}x - 4$

B. $y = \frac{2}{3}x - 4$

D. $y = -\frac{2}{3}x + 4$

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32. Greg rents a clown for his son's birthday party. The graph below shows the total charges, y, in dollars, for renting a clown for x hours. The total charges include a fixed fee that covers the cost of traveling to and from the party.

The Cost of Renting a Clown

Which statement best describes how the total charges, in dollars, changes every x number of hours?

A. Every hour the total charges increase by $30.

B. Every 2 hours the total charges increase by $15.

C. Every 2 hours the total charges increase by $30.

D. Every 3 hours the total charges increase by $75.

33. Which equation describes the line graphed below?

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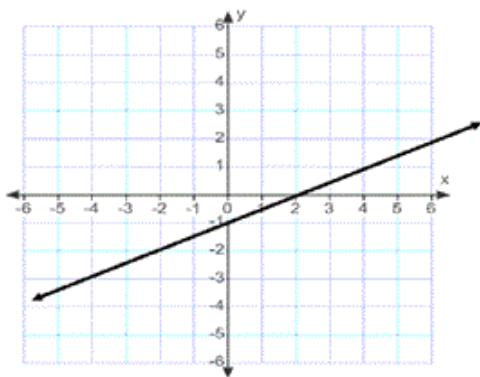
A. $y = \frac{1}{2}x - 1$

C. $y = 2x - 1$

B. $y = \frac{1}{2}x + 1$

D. $y = 2x + 1$

34. Which equation does not represent a linear function?

A. $y = 3x + x - 1$

C. $y = 2x + 1$

B. $y = x^2 + 1$

D. $y = 5x + 2$

35. Bill started a savings account in the beginning of January. He adds the same amount of money to the savings account each month. The table below shows the balance, y, in dollars, of the savings account at the end of each month, x.

Bank Statement

Months (x)	Balance (y) (in dollars)
February (2)	$2,770
March (3)	$3,405
April (4)	$4,040
May (5)	$4,675

How much money did Bill start the savings account with in the beginning of January?

A. $635

C. $1,500

B. $1,270

D. $2,135

36. At the laundromat, the soap dispenser requires nickels, and the washer requires quarters. Sam uses a total of 41 coins and spends a total of $5.25. Using the system of equations, $n + q = 41$ and $0.05n + 0.25q = 5.25$, determine the number of nickels, n, and the number of quarters, q, Sam uses.

A. 23 nickels and 18 quarters

C. 25 nickels and 16 quarters

B. 24 nickels and 17 quarters

D. 26 nickels and 15 quarters

37.

The area of a trapezoid can be determined by the equation $A = \frac{1}{2}h(b_1 + b_2)$, where A is the area, h is the height, b_1 is base 1 and b_2 is base 2. Which equation is equivalent when solved for the unknown b_2 ?

A. $b_2 = \frac{Ah}{2} + b_1$

C. $b_2 = \frac{2A}{h} - b_1$

B. $b_2 = \frac{2A}{h} + b_1$

D. $b_2 = \frac{A}{2h} - b_1$

38. A city council hopes to raise $5,000 for the construction of a new skate park by hosting a skateboarding competition. The list below shows how the competition organizers expect to raise money.

• The city council expects to sell 200 admission tickets to children under 12 years old.
• The city council expects to sell 500 full-price admission tickets (to visitors who are 12 years or older).
• Full-price admission tickets will cost twice as much as tickets for visitors who are under 12 years old.
• The organizers will spend $2,500 to bring professional skateboarders to the competition.

Which value represents the minimum amount of money the city council should charge for a full-price admission ticket in order to meet its fund-raising goal?

A. $6.25

C. $10.75

B. $8.50

D. $12.50

39. Andrew has $10. For every yard he mows, he receives an additional $6. Which inequality is used to find the number of lawns, x, he needs to mow to earn more than $34?

A. $6x + 10 < 34$

C. $6x - 10 < 34$

B. $6x + 10 > 34$

D. $6x - 10 > 34$

40.

Given the height, *h*, and the volume *V* of a certain cylinder, Alex uses the formula $r = \sqrt{\dfrac{V}{\pi h}}$ to compute its radius, *r*, to be 10 meters.

A second cylinder has the same volume as the first cylinder, but it is 25 times taller. What is the radius of the second cylinder?

A. $\dfrac{2}{5}$ meter

B. 2 meters

C. 50 meters

D. 250 meters

41.

The measure of an interior angle, *m*, of a regular polygon is given by the equation $m = \dfrac{180(n-2)}{n}$, where *n* is the number of sides. Which equation can be used to solve for the number of sides, *n*?

A. $n = \dfrac{360}{(180 - m)}$

B. $n = \dfrac{2}{(180 - m)}$

C. $n = \dfrac{180(m - 2)}{m}$

D. $n = \dfrac{180n - 360}{m}$

42. Alejandro has 3 times as many $20 bills in his wallet as he has $5 bills. He also has twice as many $1 bills than $20 bills. If he has a total of $142 in his wallet, how much money does Alejandro have in $1 bills?

A. $2

B. $6

C. $10

D. $12

43. A flying object's height in the sky can be represented by the equation $d = 30 + vt + 4t^2$, where *d* is the height in feet, *v* is the velocity in feet per second, and *t* is the time in seconds. How long has the flying object been traveling if it has a velocity of 8 feet per second and has risen to a height of 126 feet?

A. 4 seconds

B. 6 seconds

C. 8 seconds

D. 16 seconds

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44. The manager of a film production studio purchased 10 gigabytes of online storage to create an archive of photographs and video files. The manager will use the following facts to determine the amount of content that can be stored online.

Fact 1: The studio will reserve 20% of the storage to store photographs.

Fact 2: Each minute of video requires 0.17 gigabytes of storage.

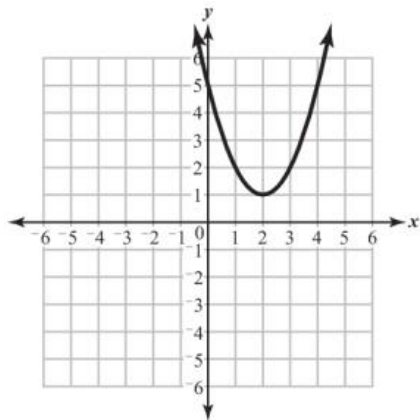Which inequality can be used to determine, m, the number of minutes of video that can be stored online?

A. $0.17m + 2 \le 10$

C. $0.17m - 2 \le 10$

B. $0.17m + 2 \ge 10$

D. $0.17m - 2 \ge 10$

45.

The graph below displays a quadratic function: $f(x) = x^2 - 4x + 5$.

Estimate the average rate of change of $f(x)$ over the interval $2 \le x \le 4$.

A. $\frac{1}{2}$

C. 2

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

D. 4

46. A population of 2,500 fish will be introduced into a lake at a park. Park rangers expect that the change in the fish population can be modeled using the function below, where $f(x)$ represents the population in thousands, and x represents the number of years.

$$f(x) = 2.5(1.10)^x$$

Which value represents the **best** estimate of the amount the population will increase per year during the first 3 years after the fish are introduced into the lake?

A. 276

C. 1,109

B. 828

D. 3,328

47. The number of instructors that are hired at a summer camp depends upon the number of students enrolled. The graph below shows the function $f(x)$, where x represents the number of students enrolled and $f(x)$ represents the number of instructors that are hired.

Summer Camp
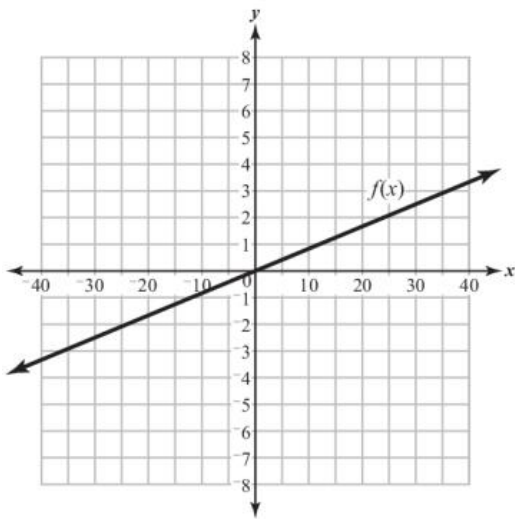
Which statement **best** describes the domain that should be used when evaluating $f(x)$?

A. the set of integers

C. the set of positive integers

B. the set of all real numbers

D. the set of positive real numbers

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48. A school newspaper created an online news subscription service. The administrators of the service made predictions about the number of subscribers. Which prediction can be modeled using a linear equation?

A. Each month, the number of subscribers will increase by 15%.

B. The number of subscribers will double after each 12-month period.

C. After reaching a maximum, the number of subscribers will decrease by $\frac{1}{12}$ each month.

D. The number of new subscribers added each month will be 10% of the original student population.

49. The functions $f(x)$ and $g(x)$ are represented below by an equation and a graph.

$$f(x) = 2\left(-x^2 + 2x + 8\right)$$
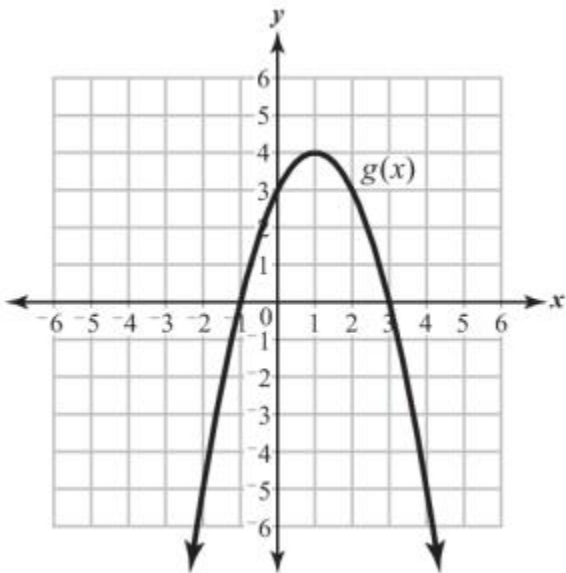
Which statement correctly compares the maximum values of the two functions?

A. The maximum of $f(x)$ is 1 unit greater than the maximum of $g(x)$.

B. The maximum of $f(x)$ is 5 units greater than the maximum of $g(x)$.

C. The maximum of $f(x)$ is 13 units greater than the maximum of $g(x)$.

D. The maximum of $f(x)$ is 14 units greater than the maximum of $g(x)$.

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