Math 1 Released Test: CALCUATOR ACTIVE

16. Which expression is equivalent to $\sqrt[3]{8x^2y^3z^4}$?

A. $2x^{\frac{3}{2}}yz^{\frac{3}{4}}$

B. $2x^{\frac{2}{3}}yz^{\frac{4}{3}}$

C $\frac{2z}{x}$

D $\frac{2x}{z}$

17 A school purchases boxes of candy bars.

- Each box contains 50 candy bars.
- Each box costs $30.

How much does the school have to charge for each candy bar to make a profit of $10 per box?

A $0.40

B $0.50

C $0.80

D $1.25

18 Energy and mass are related by the formula $E = mc^2$.

- m is the mass of the object.
- c is the speed of light.

Which equation finds m, given E and c?

A $m = E - c^2$

B $m = Ec^2$

C $m = \frac{c^2}{E}$

D $m = \frac{E}{c^2}$

19 Suppose that the equation $V = 20.8x^2 - 458.3x + 3{,}500$ represents the value of a car from 1964 to 2002. What year did the car have the least value? ($x = 0$ in 1964)

A 1965

B 1970

C 1975

D 1980

20 Which expression is equivalent to $\left(x^{\frac{1}{3}}\right)^{-3}$?

A $\sqrt{x}$

B $\frac{1}{x}$

C $\frac{1}{x^9}$

D $\frac{1}{x^{27}}$

21 The table below shows the average weight of a type of plankton after several weeks.

Time (weeks)	**Weight** (ounces)
8	0.04
9	0.07
10	0.14
11	0.25
12	0.49

What is the average rate of change in weight of the plankton from week 8 to week 12?

A 0.0265 ounce per week

B 0.0375 ounce per week

C 0.055 ounce per week

D 0.1125 ounce per week

22 Dennis compared the y-intercept of the graph of the function $f(x) = 3x + 5$ to the y-intercept of the graph of the linear function that includes the points in the table below.

x	$g(x)$
$^{-}7$	2
$^{-}5$	3
$^{-}3$	4
$^{-}1$	5

What is the difference when the y-intercept of $f(x)$ is subtracted from the y-intercept of $g(x)$?

A $^{-}11.0$

B $^{-}9.3$

C 0.5

D 5.5

23 Cell phone Company Y charges a \$10 start-up fee plus \$0.10 per minute, x. Cell phone Company Z charges \$0.20 per minute, x, with no start-up fee. Which function represents the difference in cost between Company Y and Company Z?

A $f(x) = {}^{-}0.10x - 10$

B $f(x) = {}^{-}0.10x + 10$

C $f(x) = 10x - 0.10$

D $f(x) = 10x + 0.10$

24 Monica did an experiment to compare two methods of warming an object. The results are shown in the table below.

Time (Hours)	**Method 1 Temperature** (°F)	**Method 2 Temperature** (°F)
0	0	1.5
1	5	3
2	11	6
3	15	12
4	19	24
5	25	48

Which statement ***best*** describes her results?

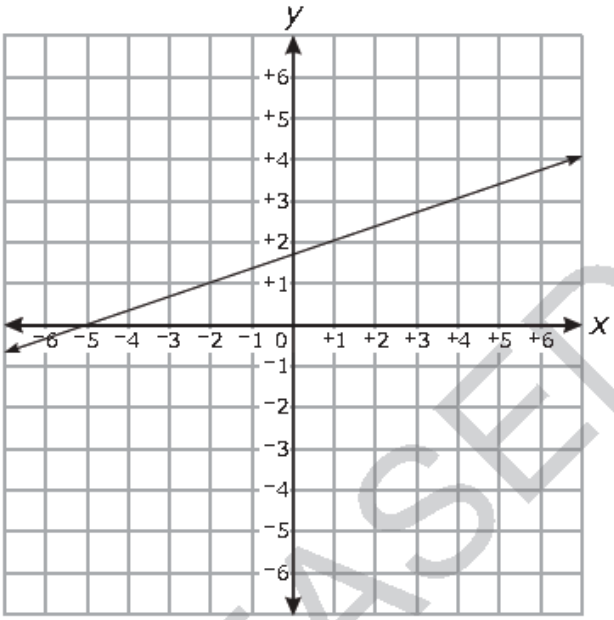
A The temperature using both methods changed at a constant rate.

B The temperature using both methods changed exponentially.

C The temperature using Method 2 changed at a constant rate.

D The temperature using Method 2 changed exponentially.

25 Mario compared the slope of the function graphed below to the slope of the linear function that has an x-intercept of $\frac{4}{3}$ and a y-intercept of $^{-}2$.



What is the slope of the function with the smaller slope?

A $\frac{1}{5}$

B $\frac{1}{3}$

C 3

D 5

26 The boiling point of water, T (measured in degrees), at altitude a (measured in feet) is modeled by the function $T(a) = {}^{-}0.0018a + 212$. In terms of altitude and temperature, which statement describes the meaning of the slope?

A The boiling point increases by 18 degrees as the altitude increases by 1,000 feet.

B The boiling point increases by 1.8 degrees as the altitude increases by 1,000 feet.

C The boiling point decreases by 18 degrees as the altitude increases by 1,000 feet.

D The boiling point decreases by 1.8 degrees as the altitude increases by 1,000 feet.

27 A line segment has endpoints $J(2, 4)$ and $L(6, 8)$. The point K is the midpoint of $\overline{JL}$. What is an equation of a line perpendicular to $\overline{JL}$ and passing through K?

A $y = {}^{-}x + 10$

B $y = {}^{-}x - 10$

C $y = x + 2$

D $y = x - 2$

28 A triangle has vertices at $(1, 3)$, $(2, {}^{-}3)$, and $({}^{-}1, {}^{-}1)$. What is the ***approximate*** perimeter of the triangle?

A 10

B 14

C 15

D 16

29 The table below shows the area of several states.

State	**Area** (thousands of square miles)
Connecticut	6
Georgia	59
Maryland	12
Massachusetts	11
New Hampshire	9
New York	54
North Carolina	54
Pennsylvania	46

Delaware has an area of 2,000 square miles. Which is true if Delaware is included in the data set?

A The mean increases.

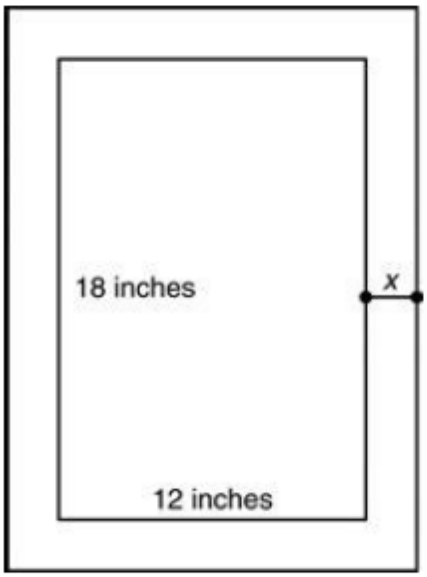
B The range decreases.

C The interquartile range decreases.

D The standard deviation increases.

30.

A frame *x* inches wide is shown around a 12-inch by 18-inch rectangular picture. The area of the framed picture can be represented by the expression $(2x + 12)(2x + 18)$.



What is the width of the frame if the area of the framed picture is 391 square inches?

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

B. $3\frac{1}{2}$ inches

C. $12\frac{1}{2}$ inches

D. $17\frac{1}{2}$ inches

31.

A man drops a ball from the top of a 300 foot cliff. The height of the falling ball is modeled by $h(t) = -16t^2 + 300$ where *h* is in feet and *t* is in seconds. How long does it take for the ball to be 44 feet above the ground?

A. 4 seconds

B. 9 seconds

C. 16 seconds

D. 19 seconds

32 The table below shows the distance a car has traveled.

Minutes	25	50	75	100	125
Distance Traveled (in miles)	20	40	60	80	100

What is the meaning of the slope of the linear model for the data?

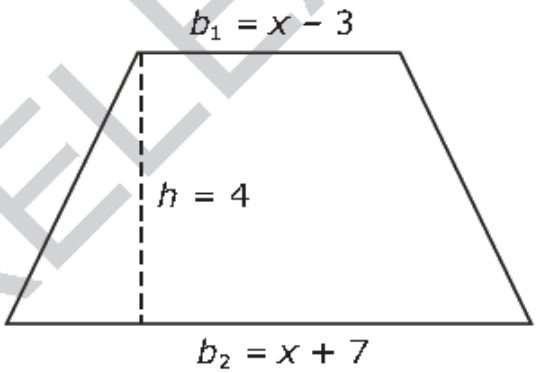
A The car travels 5 miles every minute.

B The car travels 4 miles every minute.

C The car travels 4 miles every 5 minutes.

D The car travels 5 miles every 4 minutes.

33 The area of a trapezoid is found using the formula $A = \frac{1}{2}h(b_1 + b_2)$, where A is the area, h is the height, and b_1 and b_2 are the lengths of the bases.



What is the area of the above trapezoid?

A $A = 4x + 2$

B $A = 4x + 8$

C $A = 2x^2 + 4x - 21$

D $A = 2x^2 + 8x - 42$

34 A company produces packs of pencils and pens.

- The company produces at least 100 packs of pens each day, but no more than 240.
- The company produces at least 70 packs of pencils each day, but no more than 170.
- A total of less than 300 packs of pens and pencils are produced each day.
- Each pack of pens makes a profit of $1.25.
- Each pack of pencils makes a profit of $0.75.

What is the maximum profit the company can make each day?

A $338.75

B $344.25

C $352.50

D $427.50

35 John mixed cashews and almonds.

- John bought 4 pounds of almonds for a total cost of $22.
- The cost per pound for cashews is 60% more than the cost per pound for almonds.
- John bought enough cashews that, when he mixed them with the almonds, the mixture had a value of $6.50 per pound.

Approximately what percent of the mixture, by weight, was cashews?

A 20%

B 25%

C 30%

D 35%

36 Lucy and Barbara began saving money the same week. The table below shows the models for the amount of money Lucy and Barbara had saved after x weeks.

Lucy's Savings	$f(x) = 10x + 5$
Barbara's Savings	$g(x) = 7.5x + 25$

After how many weeks will Lucy and Barbara have the same amount of money saved?

A 1.1 weeks

B 1.7 weeks

C 8 weeks

D 12 weeks

37 Collin noticed that various combinations of nickels and dimes could add up to $0.65.

- Let x equal the number of nickels.
- Let y equal the number of dimes.

What is the domain where y is a function of x and the total value is $0.65?

A {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13}

B {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13}

C {0, 1, 3, 5, 7, 9, 11, 13}

D {1, 3, 5, 7, 9, 11, 13}

38 The value of an antique car is modeled by the function $V(x) = 107{,}000(1.009)^{\left(\frac{2}{3}x\right)}$ where x is the number of years since 2005. By what ***approximate*** percent rate is the value of the car increasing per year?

A 0.04%

B 0.14%

C 0.60%

D 1.40%

39 The table below shows the cost of a pizza based on the number of toppings.

Number of Toppings (n)	**Cost** (C)
1	\$12
2	\$13.50
3	\$15
4	\$16.50

Which function represents the cost of a pizza with n toppings?

A $C(n) = 12 + 1.5(n - 1)$

B $C(n) = 1.5n + 12$

C $C(n) = 12 + n$

D $C(n) = 12n$

40 Paul sells chocolate chip cookies and peanut butter cookies.

- Baking a batch of chocolate chip cookies takes 1.75 cups of flour and 2 eggs.
- Baking a batch of peanut butter cookies takes 1.25 cups of flour and 1 egg.
- Paul has 10 cups of flour and 12 eggs.
- He makes $4 profit per batch of chocolate chip cookies.
- He makes $2 profit per batch of peanut butter cookies.

How many batches of peanut butter cookies should Paul make to maximize his profit?

A 1

B 2

C 5

D 8

41 The sequence below shows the number of trees a nursery plants each year.

2, 8, 32, 128, ...

Which formula could be used to determine the number of trees the nursery will plant next year, NEXT, if the number of trees planted this year, NOW, is known?

A $NEXT = 4 \cdot NOW$

B $NEXT = \frac{1}{4}NOW$

C $NEXT = 2 \cdot NOW + 4$

D $NEXT = NOW + 6$

42 There were originally 4 trees in an orchard. Each year the owner planted the same number of trees. In the 29th year, there were 178 trees in the orchard. Which function, $t(n)$, can be used to determine the number of trees in the orchard in any year, n?

A $t(n) = \frac{178}{29}n + 4$

B $t(n) = \frac{178}{29}n - 4$

C $t(n) = 6n + 4$

D $t(n) = 29n - 4$

43 The vertices of quadrilateral $EFGH$ are $E(^{-}7, 3)$, $F(^{-}4, 6)$, $G(5, ^{-}3)$, and $H(2, ^{-}6)$. What kind of quadrilateral is $EFGH$?

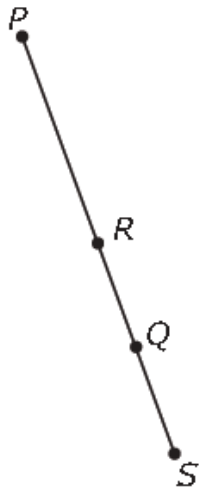
A trapezoid

B square

C rectangle that is not a square

D rhombus that is not a square

44 R is the midpoint of segment PS. Q is the midpoint of segment RS.



P is located at (8, 10), and S is located at (12, $^{-}$6). What are the coordinates of Q?

A (4, 2)

B (2, $^{-}$8)

C (11, $^{-}$2)

D (10, 2)

45 The sequence below shows the total number of days Francisco had used his gym membership at the end of weeks 1, 2, 3, and 4.

4, 9, 14, 19, ...

Assuming the pattern continued, which function could be used to find the total number of days Francisco had used his gym membership at the end of week n?

A $f(n) = n + 5$

B $f(n) = 5n - 1$

C $f(n) = 5n + 4$

D $f(n) = n^2$

46.

Robert takes medicine for an ear infection. There are 250,000 bacteria present when he begins taking the medicine, and 35% of the bacteria are destroyed every hour. How many hours will it take for 70% of the original bacteria to be destroyed?

A. 4 hours

B. 3 hours

C. 2 hours

D. 1 hour

47 The number of points scored by a basketball player in the first eight games of a season are shown below.

15, 35, 18, 30, 25, 21, 32, 16

What would happen to the data distribution if she scored 24, 22, 27, and 28 points in her next four games?

A The data distribution would become less peaked and more widely spread.

B The data distribution would become less peaked and less widely spread.

C The data distribution would become more peaked and less widely spread.

D The data distribution would become more peaked and more widely spread.

48 The table below shows the shoe size and age of 7 boys.

Name	Shoe Size (x)	Age (y)
Tyrone	6	9
Marcel	6	11
Patrick	7	15
Bobby	8	11
Dylan	9	15
Mike	10	16
Jonathan	12	17

Approximately what percent of the boys' ages is more than 1 year different from the age predicted by the line of best fit for the data?

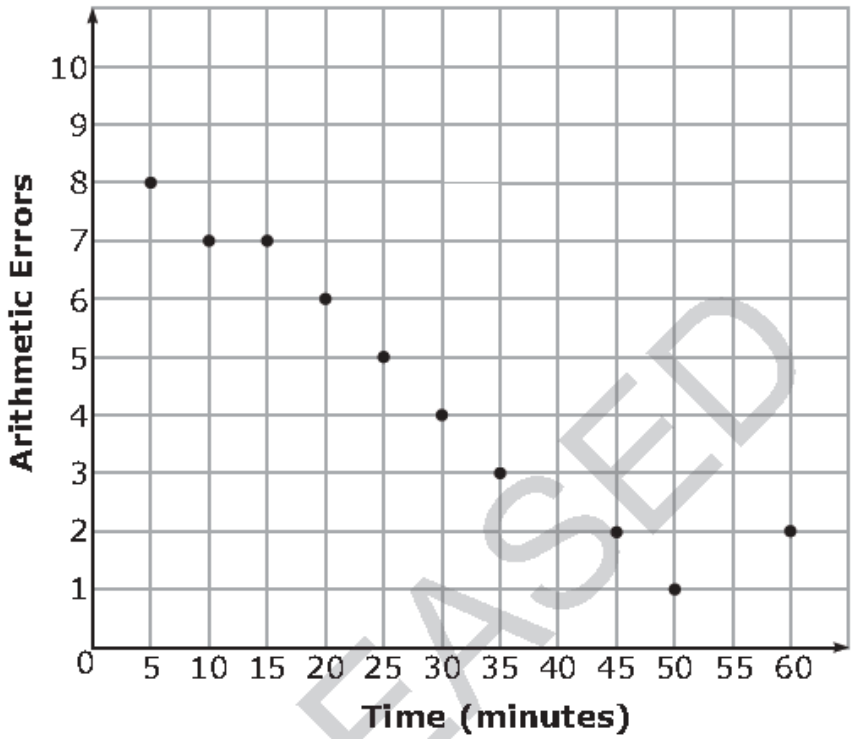
A 14%

B 29%

C 43%

D 57%

49 The scatterplot below shows the number of arithmetic errors 10 students made on a quiz and the amount of time the students took to complete the quiz.



Which describes the relationship between the number of arithmetic errors the students made and the amount of time the students took to complete the quiz?

A There is a strong positive relationship between the variables.

B There is a strong negative relationship between the variables.

C There is a weak positive relationship between the variables.

D There is a weak negative relationship between the variables.

50 An elevator can hold a maximum of 1,500 pounds. Eight people need to use the elevator. Bill had some measures from the data set of how much each person weighed. Which measure would be most useful to determine if the people can safely use the elevator?

A mean

B median

C mode

D interquartile range