Name……..Period…….Feb. 23, 2024

Classwork

1.

When solving the equation $4(3x^2 + 2) - 9 = 8x^2 + 7$, Emily wrote $4(3x^2 + 2) = 8x^2 + 16$ as her first step. Which property justifies Emily's first step?

(1) addition property of equality

(2) commutative property of addition

(3) multiplication property of equality

(4) distributive property of multiplication over addition

2.

Officials in a town use a function, C, to analyze traffic patterns. $C(n)$ represents the rate of traffic through an intersection where n is the number of observed vehicles in a specified time interval. What would be the most appropriate domain for the function?

(1) $\{\ldots -2, -1, 0, 1, 2, 3, \ldots\}$

(2) $\{-2, -1, 0, 1, 2, 3\}$

(3) $\left\{0, \frac{1}{2}, 1, 1\frac{1}{2}, 2, 2\frac{1}{2}\right\}$

(4) $\{0, 1, 2, 3, \ldots\}$

3.

If $A = 3x^2 + 5x - 6$ and $B = -2x^2 - 6x + 7$, then $A - B$ equals

(1) $-5x^2 - 11x + 13$

(2) $5x^2 + 11x - 13$

(3) $-5x^2 - x + 1$

(4) $5x^2 - x + 1$

4.

Which value of x satisfies the equation $\frac{7}{3}\left(x + \frac{9}{28}\right) = 20$?

(1) 8.25

(2) 8.89

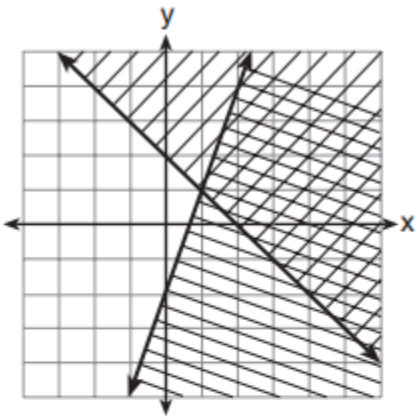
(3) 19.25

(4) 44.92

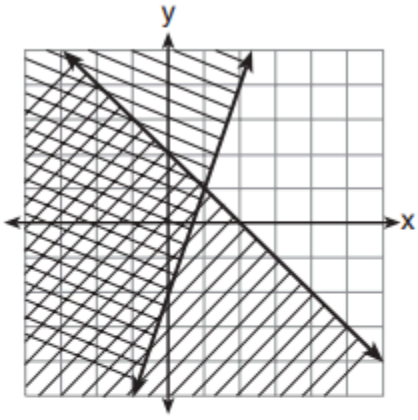
5

Given: $y + x > 2$
$y \leq 3x - 2$

Which graph shows the solution of the given set of inequalities?



(1)



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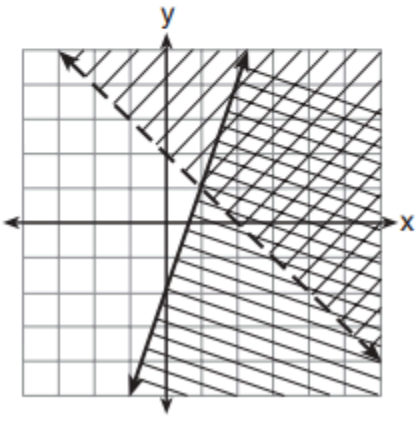

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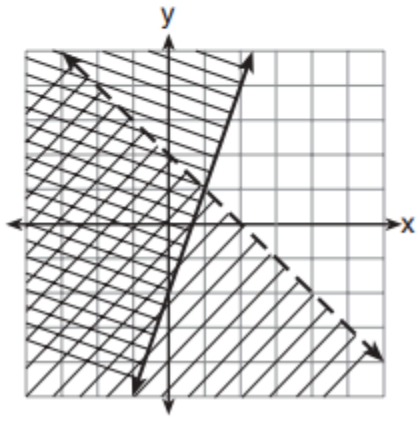


(4)

6

Which equation has the same solution as $x^2 - 6x - 12 = 0$?

(1) $(x + 3)^2 = 21$

(2) $(x - 3)^2 = 21$

(3) $(x + 3)^2 = 3$

(4) $(x - 3)^2 = 3$

7.

The table below shows the average yearly balance in a savings account where interest is compounded annually. No money is deposited or withdrawn after the initial amount is deposited.

Year	Balance, in Dollars
0	380.00
10	562.49
20	832.63
30	1232.49
40	1824.39
50	2700.54

Which type of function best models the given data?

(1) linear function with a negative rate of change

(2) linear function with a positive rate of change

(3) exponential decay function

(4) exponential growth function

8.

A company that manufactures radios first pays a start-up cost, and then spends a certain amount of money to manufacture each radio. If the cost of manufacturing r radios is given by the function $c(r) = 5.25r + 125$, then the value 5.25 best represents

(1) the start-up cost

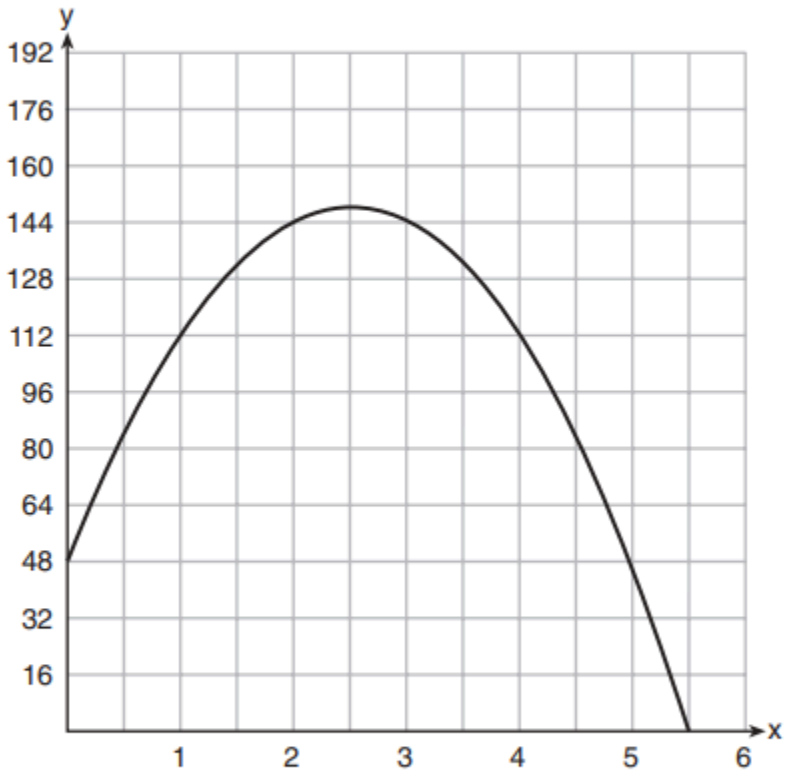
(2) the profit earned from the sale of one radio

(3) the amount spent to manufacture each radio

(4) the average number of radios manufactured

9

A ball is thrown into the air from the edge of a 48-foot-high cliff so that it eventually lands on the ground. The graph below shows the height, y, of the ball from the ground after x seconds.



For which interval is the ball's height always *decreasing*?

(1) $0 \leq x \leq 2.5$

(2) $0 < x < 5.5$

(3) $2.5 < x < 5.5$

(4) $x \geq 2$

10.

What are the roots of the equation $x^2 + 4x - 16 = 0$?

(1) $2 \pm 2\sqrt{5}$

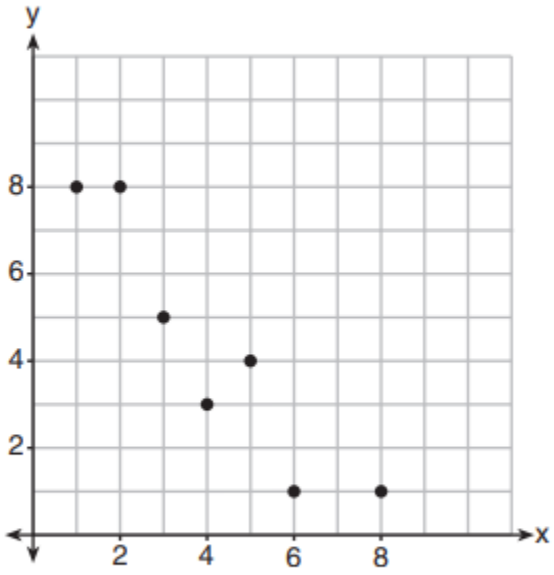
(2) $-2 \pm 2\sqrt{5}$

(3) $2 \pm 4\sqrt{5}$

(4) $-2 \pm 4\sqrt{5}$

11.

What is the correlation coefficient of the linear fit of the data shown below, to the *nearest hundredth*?



(1) 1.00
(2) 0.93
(3) −0.93
(4) −1.00

12.

Keith determines the zeros of the function $f(x)$ to be -6 and 5. What could be Keith's function?

(1) $f(x) = (x + 5)(x + 6)$
(2) $f(x) = (x + 5)(x - 6)$
(3) $f(x) = (x - 5)(x + 6)$
(4) $f(x) = (x - 5)(x - 6)$

13.

Given: $L = \sqrt{2}$
$M = 3\sqrt{3}$
$N = \sqrt{16}$
$P = \sqrt{9}$

Which expression results in a rational number?

(1) $L + M$
(2) $M + N$
(3) $N + P$
(4) $P + L$

14.

Which system of equations has the same solution as the system below?

$$2x + 2y = 16$$
$$3x - y = 4$$

(1) $2x + 2y = 16$
$6x - 2y = 4$

(2) $2x + 2y = 16$
$6x - 2y = 8$

(3) $x + y = 16$
$3x - y = 4$

(4) $6x + 6y = 48$
$6x + 2y = 8$

15.

The table below represents the function F.

x	3	4	6	7	8
$F(x)$	9	17	65	129	257

The equation that represents this function is

(1) $F(x) = 3^x$

(2) $F(x) = 3x$

(3) $F(x) = 2^x + 1$

(4) $F(x) = 2x + 3$

16.

John has four more nickels than dimes in his pocket, for a total of \$1.25. Which equation could be used to determine the number of dimes, x, in his pocket?

(1) $0.10(x + 4) + 0.05(x) = \$1.25$

(2) $0.05(x + 4) + 0.10(x) = \$1.25$

(3) $0.10(4x) + 0.05(x) = \$1.25$

(4) $0.05(4x) + 0.10(x) = \$1.25$

17.

If $f(x) = \frac{1}{3}x + 9$, which statement is always true?

(1) $f(x) < 0$

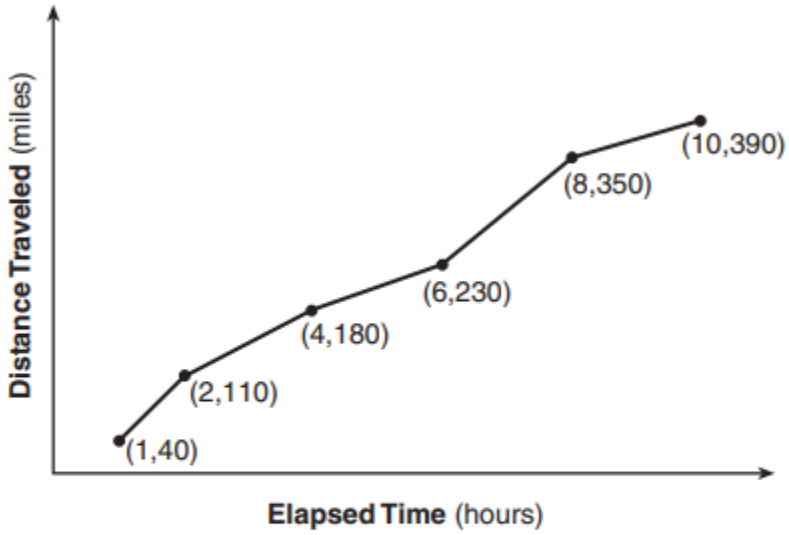
(2) $f(x) > 0$

(3) If $x < 0$, then $f(x) < 0$.

(4) If $x > 0$, then $f(x) > 0$.

18.

The Jamison family kept a log of the distance they traveled during a trip, as represented by the graph below.



During which interval was their average speed the greatest?

(1) the first hour to the second hour

(2) the second hour to the fourth hour

(3) the sixth hour to the eighth hour

(4) the eighth hour to the tenth hour

19

Christopher looked at his quiz scores shown below for the first and second semester of his Algebra class.

Semester 1: 78, 91, 88, 83, 94

Semester 2: 91, 96, 80, 77, 88, 85, 92

Which statement about Christopher's performance is correct?

(1) The interquartile range for semester 1 is greater than the interquartile range for semester 2.

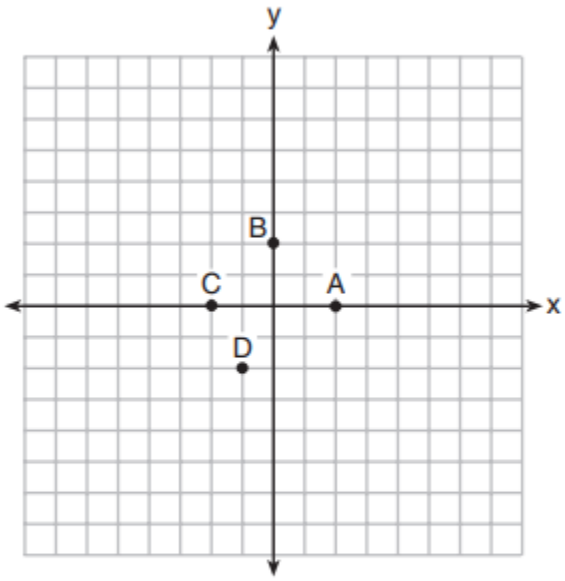
(2) The median score for semester 1 is greater than the median score for semester 2.

(3) The mean score for semester 2 is greater than the mean score for semester 1.

(4) The third quartile for semester 2 is greater than the third quartile for semester 1.

20.

The graph of $y = f(x)$ is shown below.



Which point could be used to find $f(2)$?

(1) A

(2) B

(3) C

(4) D

21.

A sunflower is 3 inches tall at week 0 and grows 2 inches each week. Which function(s) shown below can be used to determine the height, $f(n)$, of the sunflower in n weeks?

I. $f(n) = 2n + 3$

II. $f(n) = 2n + 3(n - 1)$

III. $f(n) = f(n - 1) + 2$ where $f(0) = 3$

(1) I and II

(2) II, only

(3) III, only

(4) I and III

22

A cell phone company charges \$60.00 a month for up to 1 gigabyte of data. The cost of additional data is \$0.05 per megabyte. If d represents the number of additional megabytes used and c represents the total charges at the end of the month, which linear equation can be used to determine a user's monthly bill?

(1) $c = 60 - 0.05d$

(2) $c = 60.05d$

(3) $c = 60d - 0.05$

(4) $c = 60 + 0.05d$

23

The formula for the volume of a cone is $V = \frac{1}{3}\pi r^2 h$. The radius, r, of the cone may be expressed as

(1) $\sqrt{\frac{3V}{\pi h}}$

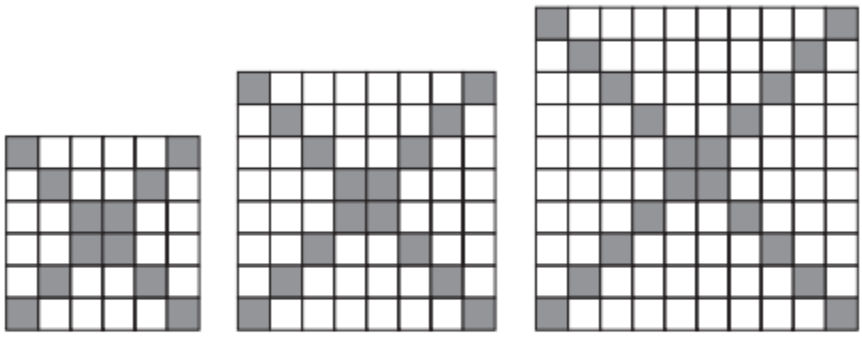
(2) $\sqrt{\frac{V}{3\pi h}}$

(3) $3\sqrt{\frac{V}{\pi h}}$

(4) $\frac{1}{3}\sqrt{\frac{V}{\pi h}}$

24

The diagrams below represent the first three terms of a sequence.



Assuming the pattern continues, which formula determines a_n, the number of shaded squares in the nth term?

(1) $a_n = 4n + 12$

(2) $a_n = 4n + 8$

(3) $a_n = 4n + 4$

(4) $a_n = 4n + 2$

25

Shawn delivered propane to homes for heat during the months of October through December. The amounts, in gallons, that Shawn delivered last year are shown in the table below.

Month	Gallons
October	x
November	$2x + 500$
December	$x^2 - 10x - 800$

Which expression represents the total amount of propane Shawn delivered for these three months?

A. $-6x - 300$

B. $-6x^5 - 300$

C. $x^2 - 7x - 300$

D. $4x^2 - 10x - 300$

26

When graphed, which equation would result in a parabola that opens downward?

A. $y = 4x^2$

B. $y = 4x^3$

C. $y = -4x^2$

D. $y = -4|x|$

27

Given $2x + ax - 7 > -12$, determine the largest integer value of a when $x = -1$.

28.

The breakdown of a sample of a chemical compound is represented by the function $p(t) = 300(0.5)^t$, where $p(t)$ represents the number of milligrams of the substance and t represents the time, in years. In the function $p(t)$, explain what 0.5 and 300 represent.