Title: LSHS Algebra I [Student Edition] Name: _____
Unit 2 Spring 2023

Question: 1

A company owns two dealerships, both of which sell cars and trucks. The first dealership sells a total of 164 cars and trucks. The second dealership sells twice as many cars and half as many trucks as the first dealership, and sells a total of 229 cars and trucks. The system of equations below represents this situation.

$$\begin{cases} x + y = 164 \\ 2x + \frac{1}{2}y = 229 \end{cases}$$

How many cars does the first dealership sell?

- A. 59
- B. 66
- C. 98
- D. 196

Question: 2

A theater sells adult and child tickets to its plays.

- 2 adult tickets and 3 child tickets cost $30.75.
- 3 adult tickets and 2 child tickets cost $33.00.

Let A represent the cost of 1 adult ticket, and C represent the cost of 1 child ticket.

Which system of equations can be used to determine the cost of each type of ticket?

A. $\begin{cases} 3A + 2C = 30.75 \\ 2A + 3C = 33 \end{cases}$

B. $\begin{cases} 2A + 3A = 30.75 \\ 3C + 2C = 33 \end{cases}$

C. $\begin{cases} 2A + 2C = 30.75 \\ 3A + 3C = 33 \end{cases}$

D. $\begin{cases} 2A + 3C = 30.75 \\ 3A + 2C = 33 \end{cases}$

Question: 3

The total cost of 2 bracelets and 3 necklaces is $15.50. The total cost of 4 bracelets and 1 necklace is $13.50. Let *b* represent the cost of each bracelet and *n* represent the cost of each necklace. This situation can be represented by the following system of equations.

$$\begin{cases} 2b + 3n = 15.50 \\ 4b + n = 13.50 \end{cases}$$

What is the cost of one bracelet?

- A. $3.50
- B. $2.50
- C. $5.00
- D. $7.75

Question: 4

Josh needs to solve the system of equations below.

$$\begin{cases} 4x + 5y = 7 \\ 2x - 3y = 9 \end{cases}$$

He decides to use the elimination method to cancel out the x terms in order to first solve for y. Josh uses the following steps:

Step 1: $4x + 5y = 7$

$$-2(2x) - 3y = 9$$

Step 2: $4x + 5y = 7$

$$-4x - 3y = 9$$

Step 3: $2y = 16$

Step 4: $y = 8$

Did Josh use the correct steps to solve for y?

A. Yes, Josh correctly solved for y.

B. No, Josh should have multiplied $2x$ by 2 instead of by -2.

C. No, Josh should have multiplied the entire second equation by -2.

D. No, Josh should have multiplied the entire second equation by -4.

Question: 5

A video game awards points each time a player finds a diamond. The players' point total increases with each additional diamond the player finds, as shown in the table below.

Number of Diamonds Found	Total Points Earned
1	10
2	25
3	40
4	55
5	70

Which equation models the total points awarded, *p*, for finding *d* diamonds in this video game?

- A. $p = 4(2.5)^d$
- B. $p = 15d - 5$
- C. $p = 10d$
- D. $p = 5(2)^d$

Question: 6

Anna is going to save pennies each week according to a sequence she learned.

- She has saved 3 pennies to start on week 0.
- Each week after that, she will save twice the total number of pennies she has saved from the previous week, minus 1.

Which recursive formula can be used to determine the number of pennies Anna will save during the n^{th} week?

A. $a_n = 2a_{n-1} + 3$

B. $a_n = 2a_{n-1} - 1$

C. $a_n = 2(n-1) - 1$

D. $a_n = 2(n-1) + 3$

Question: 7

A taxi company charges its customers the following for a ride.

- A fixed charge of $3.00 per ride.
- An additional charge of $0.75 per one-half mile of travel.
- A 10% gasoline surcharge on the total of the charges.

Which equation models the functional relationship between c, the total amount in dollars that a customer would pay, based on a taxi ride of m miles, rounded up to the nearest half mile?

A. $c = 1.1\,(3 + 1.5m)$

B. $c = 0.1\,(3 + 1.5m)$

C. $c = 1.1\,(3 + 0.75m)$

D. $c = 0.1\,(3 + 0.75m)$

Question: 8

Doug starts his day at the video game arcade with $25.00. Each game costs $0.75. Which function models the sequence showing the money Doug has left after each video game that he plays?

A. $f(g) = -0.75g + 25$, where g is the number of games played

B. $f(g) = 25g - 0.75$, where g is the number of games played

C. $f(g) = 25(g - 1) - 0.75$, where g is the number of games played

D. $f(g) = -0.75(g - 1) + 25$, where g is the number of games played

Question: 9

Which function models the sequence −5, −7, −9, −11, ...?

A. $g(x) = -2x - 3$

B. $g(x) = -3x - 2$

C. $g(x) = -5x - 2$

D. $g(x) = -4x - 1$

Question: 10

A sequence is defined by the formula below.

$$a_1 = 16$$
$$a_n = a_{n-1} + 12 \text{ for } n > 1$$

Which sequence is generated by this formula?

- A. 28, 40, 52, 64, ...
- B. 16, 28, 40, 52, ...
- C. 12, 28, 44, 60, ...
- D. 16, 4, −8, −20, ...

Question: 11

Each side of a regular pentagon is $m + 10$ inches. The formula for finding the perimeter of the pentagon is shown below.

$$P = 5(m + 10)$$

Which equation shows this formula solved for *m*?

A. $m = \frac{P}{5} - 50$

B. $m = \frac{P - 50}{5}$

C. $m = \frac{P - 5}{10}$

D. $m = 5P - 50$

Question: 12

Which inequality represents all possible solutions of $-3(x+5) > 12$?

A. $x < -9$

B. $x > 1$

C. $x < 1$

D. $x > -9$

Question: 13

An inequality is shown below.

$$2x - 5 \geq -10$$

What is the solution for this inequality?

- A. $x \geq -10$
- B. $x \geq -\frac{5}{2}$
- C. $x \geq -5$
- D. $x \geq -\frac{15}{2}$

Question: 14

The function $g(x)$ has a domain of $0 \leq x \leq 10$ and a range of $-5 \leq y \leq 5$.

Which of the following sets of points might be on the graph of $g(x)$?

A. $(-2,\ 5)$

B. $(-1,\ 6)$

C. $(1,\ 9)$

D. $(8,\ 2)$

Question: 15

Look at the relation below.

$$\{(-2,4),(4,-2),(1,1),(1,-2),(0,1),(6,4)\}$$

Which ordered pair should be removed for the set of points to be a function?

- A. $(-2,4)$
- B. $(0,1)$
- C. $(1,-2)$
- D. $(6,4)$

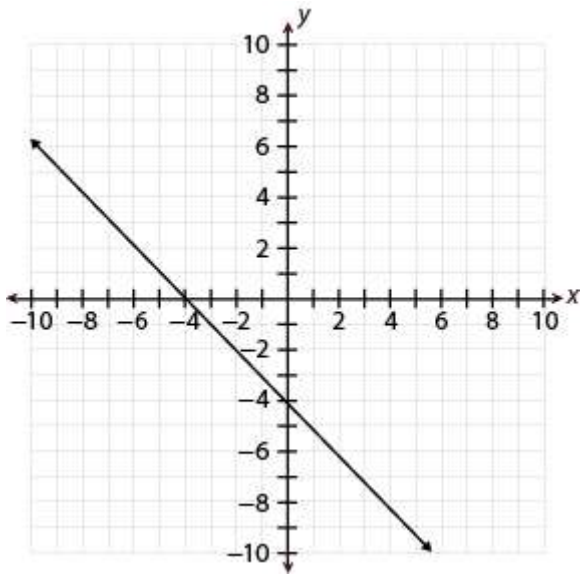
Question: 16

The table below shows the values of a linear function.

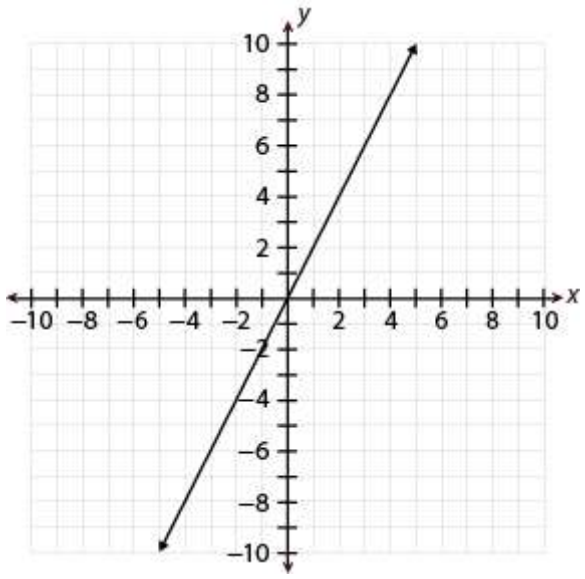
x	y
–1	–6
0	–4
1	–2
2	0
3	2

Which graph shows another function with the same *y*-intercept as the function in the table?

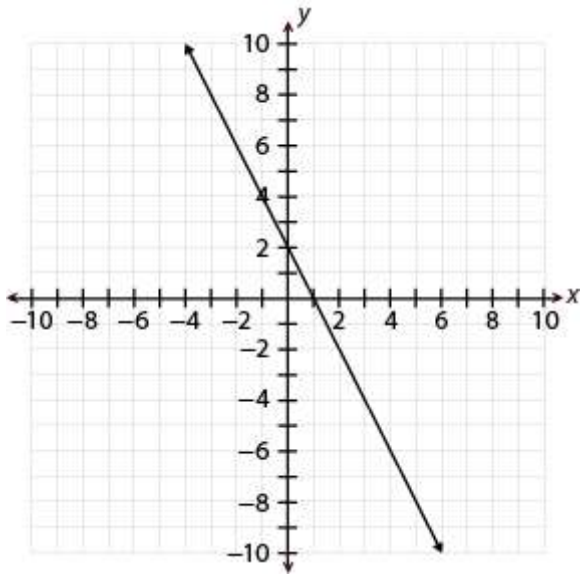
A.



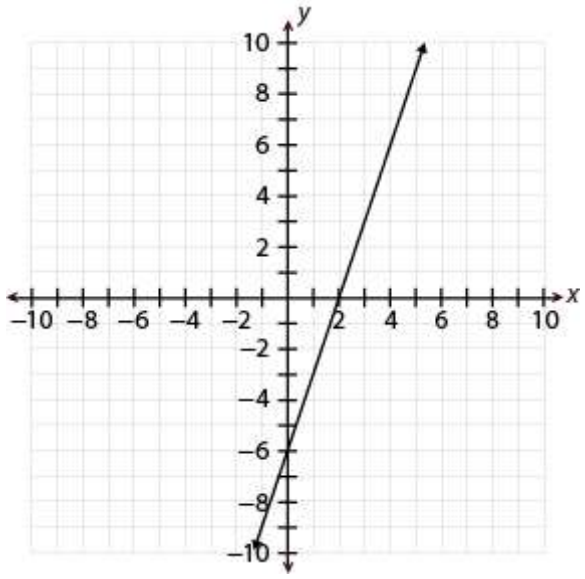
B.



C.


y
x
10
8
6
4
2
−10 −8 −6 −4 −2 2 4 6 8 10
−2
−4
−6
−8
−10

D.


y
x
10
8
6
4
2
−10 −8 −6 −4 −2 2 4 6 8 10
−2
−4
−6
−8
−10

Question: 17

Which of the following tables represents a linear function with the same slope as $y = 2 - 3x$?

A.

x	0	1	2	3	4
y	2	4	6	8	10

B.

x	0	1	2	3	4
y	2	5	8	11	14

C.

x	0	1	2	3	4
y	10	7	4	1	-2

D.

x	2	4	6	8	10
y	10	8	6	4	2

Question: 18

Two linear functions are described below.

Function $f(x)$ has the equation $f(x) = 3x - 4$.

Function $g(x)$ has the table of values shown below.

x	$g(x)$
0	4
3	5
6	6
9	7

Which statement is true regarding the functions $f(x)$ and $g(x)$?

A. The slopes of the two functions are the same.

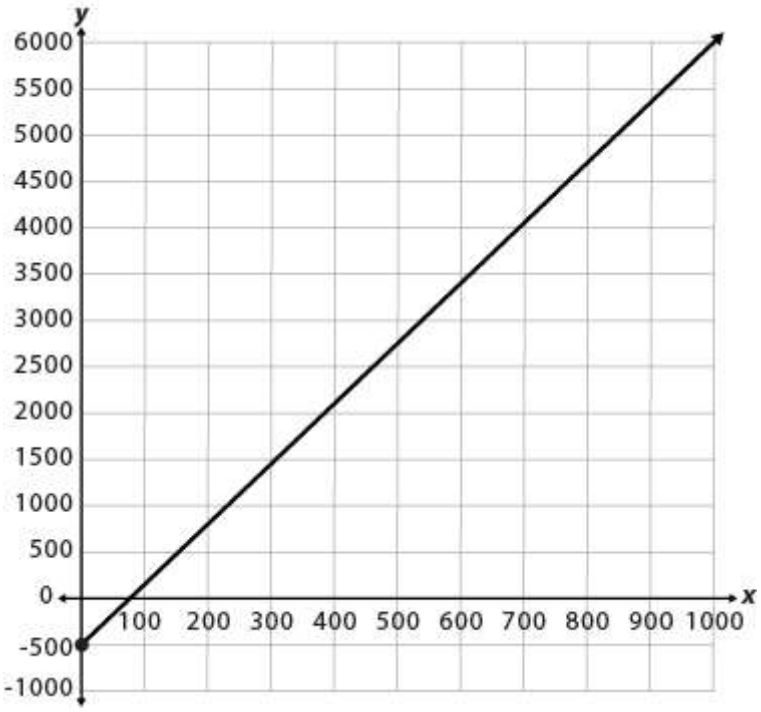
B. The slopes of the two functions are opposites.

C. The *y*-intercepts of the two functions are the same.

D. The *y*-intercepts of the two functions are opposites.

Question: 19

Fred's band recorded an album of music. The graph below shows how much profit, in dollars, *y*, Fred's band will make from selling *x* albums.



How much does the value of *y* increase for every album Fred's band sells?

- A. $6.00
- B. $7.70
- C. $6.50
- D. $5.00

Question: 20

Martine records the outside air temperature, *T*, in degrees Fahrenheit, as a function of the number of hours, *h*, since 9:00 a.m. Her data is shown in the table below.

h	0	0.5	1	1.5	2	2.5	3
T(h)	51	57	58	60	60	62	63

What is the average rate of change in temperature, in degrees Fahrenheit per hour, between 9:30 a.m. and 12:00 p.m.?

A. 0.4

B. 2.4

C. 4.0

D. 6.0

Question: 21

For which of the following functions is the average rate of change from $x = -1$ to $x = 2$ equal to 5 ?

A. $f(x) = 1 - 5x$

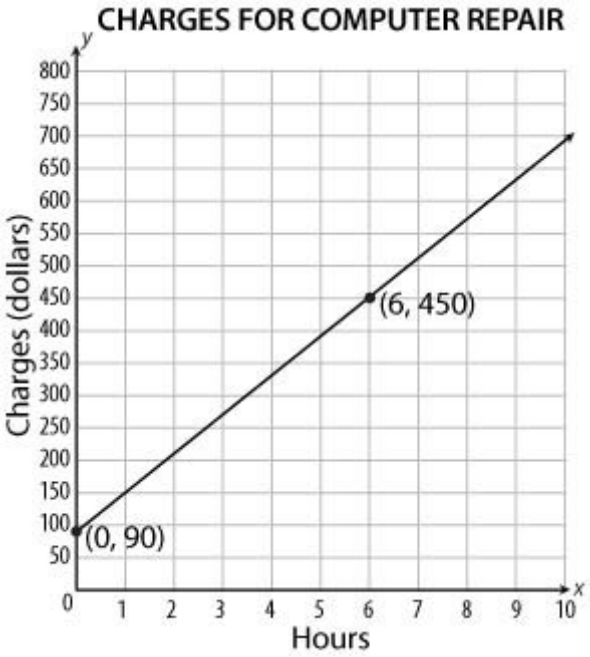
B. $f(x) = 2x + 5$

C. $f(x) = 5x + 1$

D. $f(x) = x^2 + 2x$

Question: 22

The line graphed on the coordinate plane below shows the relationship between the number of hours spent repairing a computer, and the total cost, in dollars, of the repair.



What part of the total charges for the repair is the rate charged per hour?

- A. $50 per hour
- B. $60 per hour
- C. $80 per hour
- D. $90 per hour

Question: 23

Solve for *x*.

$$2x + by = a - by$$

A. $x = \dfrac{a - 2by}{2}$

B. $x = a - 2by$

C. $x = a - by$

D. $x = \dfrac{a}{2}$

Question: 24

Which equation has no solution?

A. $-3(x+5) = x - 15 - 2x$

B. $-3(x+5) = x - 15 - 4x$

C. $-3(x+5) = x - 10 - 4x$

D. $-3(x+5) = x - 10 + 2x$

Question: 25

Jason's current age is $\frac{1}{4}$ his mom's current age. In 16 years, Jason's age will be $\frac{1}{2}$ his mom's age. The equation below can be used to determine x , Jason's current age.

$$x + 16 = \frac{1}{2}(4x + 16)$$

What is Jason's current age, in years?

A. 2 years

B. 8 years

C. 12 years

D. 16 years