Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Linear Functions Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. Determine whether the sequence is arithmetic, geometric or neither. Then, write a recursive rule and an explicit rule, if possible.

   0.25, –1.75, –3.75, –5.75, –7.75, …

   A. arithmetic, $a_1 = 0.25$; $a_n = a_{n-1} + 2$; $a_n = 2.25 + 2n$
   B. arithmetic, $a_1 = 0.25$; $a_n = a_{n-1} – 2$; $a_n = 2.25 – 2n$
   C. geometric, $a_1 = 0.25$; $a_n = a_{n-1} + 2.25$; $a_n = 2.25 + 2.25n$
   D. geometric, $a_1 = 0.25$; $a_n = a_{n-1} – 2.25$; $a_n = 2.25 – 2.25n$

2. Determine whether the relationship in the table shows a linear function. If so, write the function.

x	1	3	5	7	9
y	2.3	3.7	5.1	6.5	7.9

   A. yes, $y = 0.7x + 0.9$
   B. yes, $y = 0.7x + 1.6$
   C. yes, $y = 1.4x + 2.3$
   D. not a linear function

3. Use finite differences to write a linear function that represents the given data set.

Time, x (hours)	Cost, $f(x)$ (dollars)
0	$45
1	$70
2	$95
3	$120

   A. $f(x) = 25x + 45$
   B. $f(x) = 45x + 25$
   C. $f(x) = 25x – 45$
   D. $f(x) = 45x – 25$

4. What is the fourth term of the arithmetic sequence represented below?

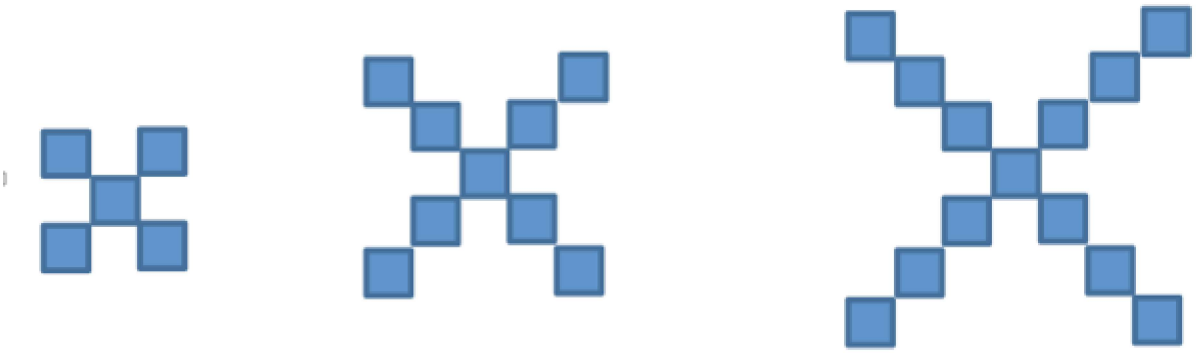
   $a_n = 6 + 8(n – 1)$

   A. 144
   B. 42
   C. 30
   D. 14

5. Which of the following sequences is a geometric sequence?

   A. 3, 6, 12, 24,…
   B. 10, 9, 7, 4,…
   C. 3, 6, 9, 12,…
   D. 19, 17, 15, 13,…

6. Which of the following is the function rule that describes the number of items, $f(n)$, used to construct the pattern in terms of the term number, n.?



A. $f(n) = 5 + 4n$
B. $f(n) = 1 + 5n$
C. $f(n) = 4 + n$
D. $f(n) = 1 + 4n$

7. What is the equation of the line with a slope of 0.7 that has a y-intercept is (0, -5)?

A. $y = 0.7x - 3$
B. $y = 0.7x - 5$
C. $y = -5x + 0.7$
D. $y = -5x - 3$

8. What is the equation of the line that contains the point (-2, -3) and has a slope of $\frac{1}{2}$?

A. $y = -\frac{2}{3}x + \frac{1}{2}$
B. $y = \frac{2}{3}x + \frac{1}{2}$
C. $y = \frac{1}{2}x - 2$
D. $y = \frac{1}{2}x - 3$

9. A book shipping company charges a $3.00 set up fee plus $0.39 for each book shipped. Does this situation represent a linear relationship? If so, which function can be used to find the total cost, c for shipping any number of books, b?

A. yes, $c = 0.39b + 3$
B. yes, $c = 3b + 0.39$
C. yes, $c = 0.39b + 0.03$
D. Not a linear function

10. Jessica noticed that the population of bacteria in the culture that she was studying started at 200 and tripled every day. Does this situation represent a linear relationship? If so, which function can be used to find the total number of bacteria, t after any number of days, d?

A. yes, $t = 3b + 200$
B. yes, $c = 200b + 3$
C. yes, $c = 3b + 200b$
D. Not a linear function

11. Which of the following functions best models the given data?

x	1	2	3	4	5	6
y	72	83.6	94.6	105.4	116.7	127.6

A. $y = 127.6 – 11x$
B. $y = 11.6x + 72$
C. $y = 11.12x + 60.88$
D. $y = 55.6x + 72$

12. When Sammy was young, his mom recorded his height over time. The table below shows some of the data she recorded.

Age (years)	7	8	9	10	11
Height (inches)	43.5	46.5	50	53.25	55.75

What will the slope of the function that models this equation represent?

A. Sammy's change in height per month
B. Sammy's change in height per year
C. Sammy's total height
D. Sammy's height since birth

13. Tamara decided to put all the money she earns from her summer job into her savings account. Her savings over time are shown below.

Time (weeks)	1	2	3	4	5	6	7
Amount in savings ($)	121	186.10	254.10	325.35	393.15	463.15	531.65

Which of the following best represents the slope of the linear function that models this situation?

A. 58.66
B. 65.10
C. 68.44
D. 324.93

14. Write an equation in slope-intercept form for the line that satisfies the following condition.

slope $\frac{1}{2}$ and passes through (4, –17)

A. $y = 4x - 19$

B. $y = \frac{1}{2}x - 19$

C. $y = \frac{1}{2}x - 17$

D. $y = -17x + \frac{4}{17}$

Solve the equation. Then check your solution.

15. $h + 1.5 = 8.4$

A. 6.9
B. 12.6
C. 9.9
D. –6.9

Determine whether the sequence is an arithmetic sequence. If it is, state the common difference.

16. 5, 0, –5, –10, . . .

A. yes, –5
B. no
C. yes, 3
D. yes, 4

Find the next three terms of the arithmetic sequence.

17. 55, 47, 39, 31, . . .

A. 36, 41, 46
B. 23, 15, 7
C. 29, 27, 25
D. 26, 21, 16

18. The table below shows the distance traveled by a person driving at the rate of 60 miles per hour.

Hours	1	2	3	4	5
Distance (miles)	60	120	180	240	300

Write an equation to describe the relationship.

A. $d = 60t$
B. $d = 60 \div t$
C. $d = 60 + t$
D. $d = 60 - t$

Find the slope of the line that passes through the pair of points.

19. (–3, –2), (5, 4)

A. $\frac{3}{4}$

B. $\frac{4}{3}$

C. $-\frac{3}{4}$

D. $-\frac{4}{3}$

Write a linear equation in slope-intercept form to model the situation.

20. A television repair shop charges $35 plus $20 per hour.

A. $C = 20 + 35h$
B. $h = 35 + 20C$
C. $C = 25 + 30h$
D. $C = 35 + 20h$