

TEST NAME: **NAMSIM11314F-LE.1**
TEST ID: **132215**
GRADE: **09**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student: _____

Class: _____

Date: _____

1. Sarah asked her mother to help her save money to buy a bike. Which situation could be represented by a linear function?
 - A. Sarah's mother will give her \$10 each week.
 - B. Sarah's mother will give her 5% of what she saves each week.
 - C. Sarah's mother will give her \$5 each week, plus 1% of what Sarah has saved.
 - D. Sarah's mother will give her \$2 the first week, \$4 the second week, \$8 the third week, and so on.
2. Four students in a class created a pattern of five numbers. The table below shows the pattern each student created.

	Term 1	Term 2	Term 3	Term 4	Term 5
Ashley	2	4	8	16	32
Hector	25	31	37	43	49
Jamal	5,000	1,000	200	40	8
Karina	350	50	250	850	1,150

- Which student created a pattern that changes by a constant amount from term to term?
- A. Ashley
 - B. Hector
 - C. Jamal
 - D. Karina
3. Brandon deposited \$250 into a checking account that does not earn interest. Each month he withdrew \$10 and then deposited \$45 into the account. Which type of function **best** models the amount of money that Brandon has in his account after x months?
 - A. exponential function with a growth rate of \$55 per month
 - B. exponential function with growth rate of \$35 each month
 - C. linear function with a rate of change of \$55 each month
 - D. linear function with a rate of change of \$35 each month

4. Jasmine currently has sixteen songs downloaded in her music player. She is going to add two new songs a month to her player. Which type of function would **best** model Jasmine's total number of songs in her player after each month?

- A cubic function
- B exponential function
- C linear function
- D quadratic function

5. Which table of values represents a linear function?

A.

x	$f(x)$
4	12
5	15
6	18.75
7	23.4375

B.

x	$f(x)$
4	15
7	24
9	30
15	48

C.

x	$f(x)$
1	10
2	11
3	10
4	7

D.

x	$f(x)$
-1	3.375
0	4.5
1	6
2	8

6. In which function is the population, y , increasing by 50 each month, x ?

- A $y = 50x + 100$
- B $y = 100(50)^x$
- C $y = 100x + 50$
- D $y = 50(100)^x$

7. Jaymee is making bracelets to sell at her school's craft fair. She makes an initial purchase of \$50 of yarn and sells the bracelet for \$2 a piece. This situation is best modeled by what type of equation?
- A cubic function
 - B exponential function
 - C linear function
 - D quadratic function
8. The salaries of employees at a company increase by \$1,000 for every year of experience. Which type of function **best** models the salary of an employee after x years?
- A constant function
 - B linear function
 - C quadratic function
 - D exponential function
9. Which scenario is **best** modeled by a linear function?
- A the height of a rocket x seconds after it is launched from a 20-foot tall platform
 - B the amount of a radioactive element that decreases by half every x 10-year periods
 - C the total population of a town that has changed by 2% every x years
 - D the total price paid for x shirts that are on sale for half off

10. Which type of function **best** models the data shown in the table below?

x	y
0	4
1	5
2	7
3	11
4	19

- A. a linear function, because y is changing at a constant rate per unit interval of x
 - B. a linear function, because y is changing at a constant percent rate per unit interval of x
 - C. an exponential function, because y is changing at a constant rate per unit interval of x
 - D. an exponential function, because y is changing at a constant percent rate per unit interval of x
11. Which situation is **best** modeled by an exponential function?
- A. A restaurant charges \$5.75 per meal, plus 7.5% tax.
 - B. A cab company charges a flat fee of \$2.50, plus \$0.45 per mile traveled.
 - C. The number of cell phone subscribers increased by 75% per year for the last 20 years.
 - D. Water pressure is 14.7 pounds per square inch at sea level and increases an additional 14.7 pounds per square inch for every 10 meters of depth.
12. The value of a piece of land has doubled every 25 years since it was purchased in 1950. Which type of function **best** models the value of the land x years after 1950 and why?
- A. a linear function because the value of the land increases at a constant percent rate every 25 years
 - B. an exponential function because the value of the land increases at a constant percent rate every 25 years
 - C. a linear function because the value of the land increases by a constant amount every 25 years
 - D. an exponential function because the value of the land increases by a constant amount every 25 years

13. Which scenario is **best** modeled by an exponential function?
- A the amount of gasoline, y , used to drive a car x miles
 - B the amount of a radioactive substance, y , that is remaining after x days
 - C the amount of money, y , that Jason makes if he works x hours at his job
 - D the distance a car travels, y , in 2 hours at a speed of x miles per hour
14. Which situation could be modeled by the equation $y = 1.5(1.01)^x$?
- A an oak tree that starts out 1.5 feet tall and grows by 1% annually
 - B an oak tree that starts out 1.5 feet tall and grows by 1.01 feet annually
 - C a tuna that starts out at 1.01 feet long and grows by 50% annually
 - D a tuna that starts out at 1.01 feet long and grows by 1.5 feet annually
15. Which situation is **best** modeled by an exponential function?
- A Pam receives \$1 allowance for each chore that she completes.
 - B Sue receives \$14 in allowance, but her mother deducts \$2 for every chore not completed.
 - C Jenny receives 14% of her total allowance each day that she completes her chores.
 - D Carla earns \$20 in allowance, but her mother deducts half the amount each day when chores are not completed.

16. Which type of function **best** fits the data in the table below?

x	y
1	32
3	10
5	4
7	1

- A. exponential decay model
 - B. exponential growth model
 - C. linear model with positive slope
 - D. linear model with negative slope
17. Mariah has a job that earns a pay raise of 2.5% per year for every year that she works. Which type of function would model Mariah's pay after t years?
- A. linear function with a positive slope
 - B. linear function with a negative slope
 - C. exponential growth function
 - D. exponential decay function
18. Which choice could be modeled by an exponential function?
- A. the speed of a car that is decreasing by 3 mph every minute
 - B. the number of push-ups a person does each day if the number of push-ups increases by 2 each day
 - C. the amount a person gets paid if the person's pay increases by 2 percent each year
 - D. the number of students in a class if no students join or leave the class

19. Which table of values represents an exponential function?

A.

x	$f(x)$
1	3
2	9
3	27
4	81
5	243

B.

x	$f(x)$
1	9
2	12
3	15
4	18
5	21

C.

x	$f(x)$
1	5
2	18
3	37
4	62
5	93

D.

x	$f(x)$
1	3
2	6
3	9
4	12
5	15

20. A scientist studying a population of birds discovered that the number of birds doubled every year. Which function would **best** represent this situation?

- A. linear function with a growth rate of 200% every year
- B. linear function with a growth rate of 100% every year
- C. exponential function with a growth rate of 200% every year
- D. exponential function with a growth rate of 100% every year

21. Which scenario would **best** be modeled by an exponential growth function?
- A the salary of a worker who makes \$8 every hour
 - B the population of a town that is doubling every decade
 - C the population of a virus that is reducing in number by half every hour
 - D the amount of commission a worker makes who earns 8% commission on his total sales
22. A tennis tournament starts with 120 players. During each round of play, half of the players are eliminated from the tournament. What type of function **best** models the relationship between the number of players in the tournament, y , and the round of play, x ?
- A A linear function, because the number of players is changing at a constant rate per unit interval.
 - B A linear function, because the number of players is changing at a constant percent rate per unit interval.
 - C An exponential function, because the number of players is changing at a constant rate per unit interval.
 - D An exponential function, because the number of players is changing at a constant percent rate per unit interval.