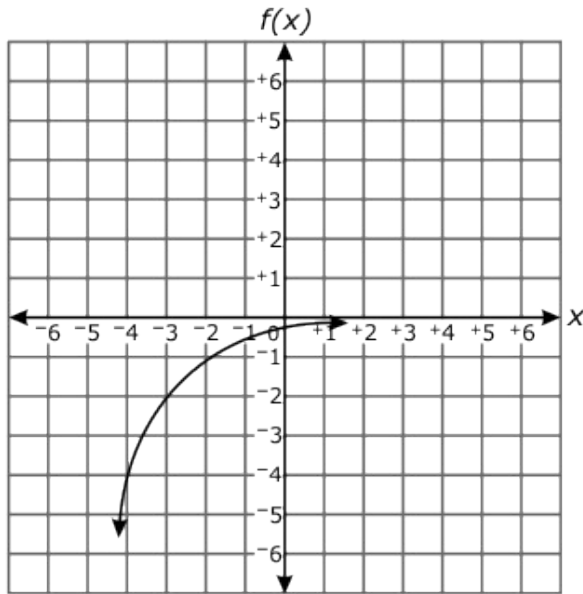TEST NAME: **Math 1 online Feb 28**
TEST ID: **2918766**
GRADE: **09 - Ninth Grade**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom**

Student: _____

Class: _____

Date: _____

1. Which function **best** models the graph shown below?

$f(x)$

A. $f(x) = 0.25(0.5)^x$

B. $f(x) = 0.5(0.25)^x$

C. $f(x) = 0.25(^-0.5)^x$

D. $f(x) = ^-0.25(0.5)^x$

2. Which function models the data in the table below?

x	y
6	⁻2
10	⁻10
12	⁻14
16	⁻22

A. $y = {}^-2x + 5$

B. $y = {}^-2x + 10$

C. $y = {}^-\frac{1}{2}x + 5$

D. $y = {}^-\frac{1}{2}x + 10$

3. **What is the 6th term in the geometric sequence?**

$$3, -9, 27, -81, \ldots$$

A. -729

B. -243

C. 243

D. 729

4. The graph of a linear function passes through the points (2,3) and (5,9). Which is an equation of the function?

A. $f(x) = 2x + 1$

B. $f(x) = 2x - 1$

C. $f(x) = 3x - 1$

D. $f(x) = 3x + 1$

5. A scientist is observing the size of a sample of bacteria. The function $f(t)$ = $1{,}000(0.995)^t$ models the size of the sample t hours after the scientist began his observations. Which statement is true about the size of the sample?

   A. The sample is growing at a rate of 99.5% per hour.

   B. The sample is decaying at a rate of 99.5% per hour.

   C. The sample is growing at a rate of 0.5% per hour.

   D. The sample is decaying at a rate of 0.5% per hour.

6. Kyle sells bags of popcorn at school events. The function $P = 1.25b - 18$ represents Kyle's profit, where P stands for profit and b stands for the number of bags of popcorn sold. His brother Nathan sells bottles of fruit juice and has kept track of his daily sales and profit in the table below.

Nathan's Sales

Bottles Sold	20	22	18	17	26
Profit	$5.00	$9.50	$0.50	⁻$1.75	$16.25

If Nathan's profit is modeled linearly, which statement can be predicted from the two models?

   A. Kyle will have a higher profit than Nathan if they each sell 50 items.

   B. Kyle will have a higher profit than Nathan if they each sell 40 items.

   C. Kyle will have a higher profit than Nathan if they each sell 30 items.

   D. Kyle will have a higher profit than Nathan if they each sell 20 items.

7. Jason compared the function $f(x) = 20(1.2)^x$ to the function that fits the values in the table below.

x	1	2	3	4	5
g(x)	12	24	48	96	192

What is the distance between the *y*-intercepts of the two functions?

A. 14

B. 8

C. 6

D. 4

8. What are the *y*- and *x*-intercepts for the graph of the equation $3x - y = 2$?

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

B. $\left(0, \ \frac{2}{3}\right), \left(^-2, \ 0\right)$

C. $\left(0, \ ^-2\right), \left(\frac{2}{3}, \ 0\right)$

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

9. What is the *x*-intercept of the graph of $f(x) = 3x + 6$?

A. $(^-2, 0)$

B. $(6, 0)$

C. $(0, \ ^-2)$

D. $(0, 6)$

10. **Hooke's Law can be used to find the force (in pounds) needed to stretch a given string x inches. Using the equation $F = \frac{5}{4}x$, what is the domain of this function if the force applied is limited to between 10 and 20 pounds inclusive?**

A. $x \geq 0$

B. $8 \leq x \leq 16$

C. $10 \leq x \leq 20$

D. $12.5 \leq x \leq 25$

11. The function $f(x) = 3.33x$ models the cost for Juan to fill his car with x gallons of gas. Juan's car can hold a maximum of 17 gallons of gas. What is the ***most appropriate*** domain of the function?

A. $x \leq 17$

B. $x \leq 56.61$

C. $0 \leq x \leq 17$

D. $0 \leq x \leq 56.61$

12. The function $f(x) = 1{,}575 - 225x$ models the value of a computer x years after it was purchased. What is an appropriate domain for this function?

A. $x \geq 0$

B. $x \leq 7$

C. $0 \leq x \geq 7$

D. $0 \leq x \leq 7$

13. A car salesman worked a 10-hour shift. The number of cars he sold during the shift is a function of the amount of time, t, that he worked. The salesman sold his first car after working 4 hours. He then sold a car every 1.5 hours. Which is an appropriate domain for the function?

A. $0 \leq t \leq 10$

B. $0 \leq t \leq 5$

C. $1 \leq t \leq 5$

D. $4 \leq t \leq 10$

14. The function $f(x) = 15{,}000(0.88)^x$ represents the value of a car over x years. What is the **most** appropriate domain for which the value of the car will be greater than 10% of its original value?

A. $x \geq 0$

B. $x > 0$

C. $0 \leq x \leq 18$

D. $0 < x < 18$

15. **A pail of water containing 150 ounces has a slow leak. The graph shows the amount of water in the pail after each hour.**
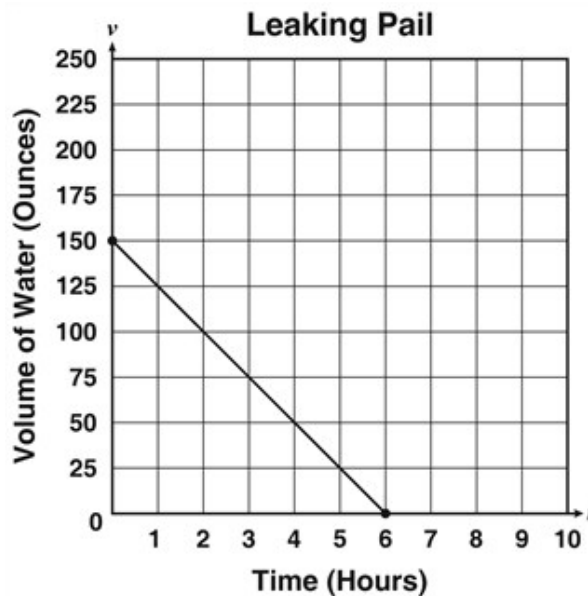
Which option correctly describes both the domain and range?

A. Domain: $t \geq 0$
   Range: $v \geq 0$

B. Domain: $t \leq 6$
   Range: $v \leq 150$

C. Domain: $0 \leq t \leq 6$
   Range: $0 \leq v \leq 150$

D. Domain: $6 \leq t \leq 150$
   Range: $6 \leq v \leq 150$

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16. Suppose on average, a high school loses about 5 students each year, because they leave to attend a charter school. Which **best** describes this relationship?

   A. An exponential function because the students are decreasing by 5 each year.

   B. A linear function because the students are decreasing by 5 each year.

   C. An exponential function because there is 5% decay.

   D. A linear function because there is 5% decay.

17. Kyle initially deposited $235 into a bank account. The bank account earns interest at a rate of 1.2%, compounded monthly. What type of function **best** models the value of the bank account over time?

   A. a linear function, because the value is increasing at a constant unit rate each month

   B. a linear function, because the value is increasing at a constant percent rate each month

   C. an exponential function, because the value is increasing at a constant unit rate each month

   D. an exponential function, because the value is increasing at a constant percent rate each month

18. Which situation is **best** modeled by a linear function?

   A. height of a toy rocket after launch

   B. distance a car travels moving at a constant speed

   C. area of a rectangle with a length that is five more than twice its width

   D. total amount of money in a savings account earning interest compounded annually

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19. The manager of a new restaurant hired 2 employees the first day she began interviewing potential candidates. The second day the manager hired 6 employees. The third day the manager hired 18 people. If this trend continues, which type of function **best** models the number of employees the manager hired t days after she began interviews?

    A. a linear function because the number of employees hired is increasing by a constant unit rate each day

    B. a linear function because the number of employees hired is increasing by a constant percent rate each day

    C. an exponential function because the number of employees hired is increasing by a constant unit rate each day

    D. an exponential function because the number of employees hired is increasing by a constant percent rate each day

20. Which scenario is **best** modeled by an exponential function?

    A. the amount of commission Jordan earns selling x dollars worth of cars at a rate of 4.5%

    B. the amount Katherine saves on an item that costs x dollars when she has a 30% off coupon

    C. the total amount a cell phone plan costs if the cost was x dollars and the cost increased 2.5% each year

    D. the number of students enrolled in a college class that began the semester with x students and 1.25% of the original students dropped the course each month

21. A local hair salon charges a bridal party to style their hair for a wedding using the function $f(x) = 25x + 75$, where x is the number of hours it takes to style the hair. What does the slope represent in the context of the scenario?

    A. the initial fee

    B. the total cost

    C. the additional cost per hour

    D. the amount of time it takes to style the hair

22. The function $P(x) = 10 + 2x$ models the amount of money Ryan earns selling ribbons at the fair each day, where $P(x)$ is the amount Ryan earns and x is the number of ribbons sold. Which statement **best** explains Ryan's pay?

A. He receives $10 for the first ribbon he sells and $2 more for every other ribbon he sells.

B. He receives $2 for the first ribbon he sells and $10 more for every other ribbon he sells.

C. He receives $10 for each day he works, plus $2 for each ribbon he sells.

D. He receives $2 for each day he works, plus $10 for each ribbon he sells.