

TEST NAME: **Sequences BANK**
TEST ID: **47626**
GRADE: **08**
SUBJECT: **Mathematics**
TEST CATEGORY: **My Classroom (Individual Teacher Assessments)**

Student: _____

Class: _____

Date: _____

- Every time a football team makes a touchdown worth 6 points, it is given the opportunity to make an extra point. So far in a game, it has made t touchdowns and scored a total of $7t - 6$ points. If touchdowns and extra points are the only way it has scored, what does 6 represent?**
 - the number of extra points attempted
 - the number of extra points made
 - the number of extra points missed
 - the number of touchdowns made

- The height above the ground in feet of a ball kicked into the air from the balcony of an apartment is $-16t^2 + 24t + 40$, where t is the time in seconds since the ball was kicked. How high above the ground is the balcony?**
 - 16 ft
 - 24 ft
 - 32 ft
 - 40 ft

- The percentage of his taxable income t that Tim owes in taxes is $\frac{0.1 \times 8700 + 0.15 \times (t - 8700)}{t}$. What does $t - 8700$ represent if Tim had more than \$8700 in taxable income?**
 - the amount of Tim's taxable income under \$8700
 - the amount of Tim's taxable income over \$8700
 - the amount of Tim's taxes under \$8700
 - the amount of Tim's taxes over \$8700

- A bank offers a savings account that currently pays 2% interest per year compounded monthly. The amount of money in the account after t years, where t represents time in years, is represented by the expression $P\left(1 + \frac{0.02}{12}\right)^{12t}$, where P represents the initial amount of money invested in the account and t represents the number of years the money has been invested.**

What will happen to the initial amount invested in the savings account when the interest rate changes from 2% to 2.25%?

 - The initial amount in the account does not change because it is a factor that is independent of both the interest rate and t .
 - The initial amount in the account does not change because it is a factor that is only dependent on t and not on the interest rate.
 - The initial amount in the account will change because it is a factor that is dependent on the interest rate but not on t .
 - The initial amount in the account will change because it is multiplied by a factor that is dependent on both the interest rate and t .

5. The formula for the surface area of a square pyramid is $A = 2bs + b^2$, where A is the surface area, b is the length of a side of the base, and s is the slant height. Which of these expressions represents the lateral area (or the surface area excluding the base) of a square pyramid?
- A. $\frac{1}{2}bs$
 B. bs
 C. b^2
 D. $2bs$
6. Jaimie has a rectangular poster and places a 1–inch border around the entire poster. She writes the expression $(2w + 3)(w + 2) - (2w + 1)w$ to represent the area of the border, where w represents the width of the original poster.

Select each true statement regarding this expression.

- A. The expression $2w + 1$ represents the length of the original poster.
 B. The expression $2w + 3$ represents the length of the original poster.
 C. The expression $(2w + 1)w$ represents the area of the original poster.
 D. The expression $(2w + 3)(w + 2)$ represents the area of the original poster.
 E. The expression $(2w + 3)(w + 2)$ represents the area of the poster with the border.
7. A student's grade–point average can be calculated by dividing the total number of grade points earned by the total number of units attempted. If Brianna's grade–point average before this semester was 3.2, and her grade–point average after this semester will be $\frac{208 + x}{65 + y}$, what does y represent?
- A. the number of grade points Brianna had earned before this semester
 B. the number of grade points Brianna will earn this semester
 C. the number of units Brianna had attempted before this semester
 D. the number of units Brianna is attempting this semester
8. A bank offers a savings account which pays 3% interest per year. The amount of money in the account after t years is represented by the expression $P\left(1 + \frac{i}{n}\right)^{nt}$, where P represents the initial amount of money invested, n represents the number of times per year the interest is compounded, i represents the interest rate, and t represents the number of years the money has been invested.

Which statement describes what happens with the savings account when the interest is compounded monthly instead of yearly? Select two that apply.

- A. The variable t will change because it is a factor that is multiplied by n .
 B. The variable t will not change because it is a factor that is independent of n .
 C. The variable i will change because it is a factor that is dependent on n .
 D. The variable P will not change because it is a factor that is independent of n .
 E. The variable P will change because it is multiplied by a factor that is dependent on n .

9. A company is designing a new cylinder. The volume of the cylinder can be represented by the following equation, $y = z \cdot \pi(10 + x)^2$. Which part of the equation represents the area of the base of the cylinder?
- z
 - $z \cdot \pi(10 + x)$
 - $10 + x$
 - $\pi(10 + x)^2$
10. If \$5000 is invested in a savings account paying 4% interest compounded annually, the number of dollars in the account after 3 years can be calculated with the formula $A = 5000(1 + 0.04)^3$, where A is the amount in the account. Which of these expressions represents the percentage, written as a decimal, of the initial amount in the account after 3 years?
- 0.04
 - $1 + 0.04$
 - $(1 + 0.04)^3$
 - $5000(1 + 0.04)^3$
11. At the beginning of a trading week, the price of a stock was \$18.25, and on each of the five days of the week, the price of the stock either rose or fell by the same percentage, which when written as a decimal is p . Suppose the price of the stock at the end of the week in dollars was $18.25(1 - p)^2(1 + p)^3$. What was the price in dollars after two days if the stock rose both of these days?
- $18.25(1 + p)$
 - $18.25(1 - p)^2$
 - $18.25(1 + p)^2$
 - $18.25(1 + p)^3$
12. In the formula, $(M_1 + M_2)p^2 = a^3$, assume the value of a^3 is constant. Then, if the value of $(M_1 + M_2)$ increases, which of the following will hold true about the value of p^2 ?
- It may either increase or decrease.
 - It must remain the same.
 - It must increase.
 - It must decrease.
13. The sum of the integers from 1 to n is $\frac{n(n+1)}{2}$. Which of these is the average of the integers from 1 to n ?
- $\frac{n}{2}$
 - $\frac{n+1}{2}$
 - n
 - $n+1$

14. The number of grams of a radioactive isotope present after t years is $1500 \left(\frac{1}{2}\right)^t$. What does 1500 represent in this situation if $t > 0$?
- A. the original number of grams of the radioactive isotope present
 - B. the number of grams of the radioactive isotope present after $\frac{1}{2}$ year
 - C. the number of grams of the radioactive isotope present after 2 years
 - D. the final number of grams of the radioactive isotope present
15. On a quiz, students were awarded a certain number of points for a correct answer and penalized a certain number of points for an incorrect answer. If a student answered all the questions on the quiz and had c correct answers, her score on the quiz was $25c - 10(15 - c)$. How many questions were on the quiz?
- A. 10
 - B. 15
 - C. 25
 - D. 35
16. Suzy invested \$30,000 at a 2% interest rate into a certificate of deposit. After 5 years, she decided to withdraw the money. The amount of money she had after 5 years is \$33,122.42 and is represented by the equation $y = 30,000(1 + 0.02)^5$.

Part A:

What decimal would Suzy need to multiply \$33,122.42 by to determine how much money she would have if she left the money in the account for one more year?

Part B:

Suzy is planning on spending \$1200 to go on vacation this year. She estimates that vacation costs will rise by 10% per year over the next 15 years. Will \$33,122.42 be enough to cover the costs of her vacations over the next 15 years if this amount does not grow at all over those years? Why or why not?

17. Stephanie has pennies, nickels, dimes, and quarters in her piggy bank. The total value of the coins is $0.01(n + 10) + 0.05n + 0.1(n - 10) + 0.25(n - 5)$, where n is the number of nickels. What must $0.1(n - 10)$ represent?
- A. the number of pennies
 - B. the number of dimes
 - C. the total value of all the pennies
 - D. the total value of all the dimes

18. A house is appreciating according to the following formula, where x represents the amount of time that has passed since the house was purchased.

$$y = 17,000(1.14)^x$$

Part A:

By what percentage is the value of the house increasing every year?

Part B:

The homeowner wishes to determine how much the value of the house is increasing every month. How could this formula be rewritten to determine this?

19. Sarah bought a used car. The value of the car, in dollars, is a function of time, in years, as represented by the expression $1500(1 - .10)^t$, where t is the time, in years, since she purchased the car.

Which of the following statements describes the meaning of .10 in the expression?

- A. the amount she paid for the car
B. the percentage by which the value of the car increases each year
C. the percentage by which the value of the car decreases each year
D. the amount of time, in years, that has passed since she bought the car
20. The surface area of a right triangular prism is $ab + h(a + b + c)$, where a and b are the lengths of the legs of a triangular base, c is the length of the hypotenuse of a base, and h is the height. What does ab represent in the formula?
- A. the area of one of the bases of the prism
B. the area of one of the non-base faces of the prism
C. the combined area of the two bases of the prism
D. the combined area of the three non-base faces of the prism
21. The formula for the area A of a trapezoid is $A = \frac{h}{2}(a + b)$, where h is the trapezoid's height and a and b are the lengths of its bases. Which of these is another way to state the formula?
- A. The area is half the trapezoid's height times half the average length of its bases.
B. The area is half the trapezoid's height times the average length of its bases.
C. The area is the trapezoid's height times half the average length of its bases.
D. The area is the trapezoid's height times the average length of its bases.
22. How many factors are there in the expression $(x - 7)(y + 11)z$?
- A. 1
B. 2
C. 3
D. 4
23. Raphael is traveling in a straight line at a constant speed from point A to point B . His distance from point B in miles is $-20t + 45$, where t is number of hours he has been traveling. What is his speed in miles per hour?
- A. 20 mph
B. 25 mph
C. 45 mph
D. 65 mph
24. Dora gets paid an hourly wage, which increases if she works over 40 hours per week. She worked a total of h hours last week, and the number of dollars she got paid was $30 \times 40 + 45 \times (h - 40)$. What does 45 represent in this situation?
- A. the number of dollars per hour she got paid for all hours under 40
B. the number of dollars per hour she got paid for all hours over 40
C. the number of hours she worked over 40
D. the total number of hours she worked

25. A soup company wants to introduce a new family size soup can that holds more soup than their traditional can, so they have decided to change the size of the cylinder-shaped can their soup is packaged in.

The volume of the can that holds the soup is represented by the expression, $h(\pi \times r^2)$ where r is the radius of the can, and h is the height of the can.

Which statements describe what will happen to the can if the soup company increases the length of the radius of the can? Select two that apply.

- A. The volume of the can will also increase because the volume is dependent on the radius.
 - B. The height of the can will also increase because the height is dependent on the radius.
 - C. The volume of the can will not change because the volume is a factor that is independent of the radius.
 - D. The height of the can will not change because the height is a factor that is independent of the radius.
26. Which of the following is true about the expression $c^5 + (-9c^2) + 40c + 7d^7e^3 - 5c^3 + 4d$?
- A. The coefficient of the third term is c .
 - B. The coefficient of the first term is 0.
 - C. The coefficient of the fourth term is 7.
 - D. There are no negative coefficients.
27. A ball is kicked off of the roof of a building. The path the ball travels is modeled by the equation $f(x) = -x^2 + 6x + 16$, where x is in meters. The x -axis represents the ground and the y -axis represents the building.

Part A:

How high off the ground was the ball when it was kicked?

Part B:

How far from the building is the ball when it lands?

28. Meg converted \$100 to francs, and she then converted the francs to pounds. In the end, she had $100fp$ pounds, where f is the number of francs per dollar, and p is the number of pounds per franc. What does fp represent?
- A. the number of dollars per pound
 - B. the number of francs per pound
 - C. the number of pounds per dollar
 - D. the number of pounds per franc
29. The value of a baseball card in dollars has been found to be $0.15y + 0.35$, where y is the number of years since it was released. By how much is the baseball card's value increasing per year?
- A. \$0.15
 - B. \$0.35
 - C. 15%
 - D. 35%

30. A company is designing a box in the shape of a rectangular prism. The surface area of the box can be represented as $2(x + 2)^2 + 4(x + 2)(x + 4)$ for some positive number x .

Based on this expression, select *each* true statement regarding the company's box design.

- A. The area of each square side of the box is $2(x + 2)^2$.
 - B. The length of each square side of the box is $(x + 2)^2$.
 - C. There are exactly two identical square sides to the box.
 - D. There are exactly four identical non-square sides to the box.
 - E. The area of each non-square side of the box is $(x + 2)(x + 4)$.
31. A salesman makes both a base salary and also a commission, which is a percentage of what he sells. Each month, if his sales total s dollars, he makes a total of $2000 + 0.1s$ dollars. What does 2000 represent?
- A. his monthly base salary in dollars
 - B. the amount of his monthly sales in dollars
 - C. his total monthly pay in dollars
 - D. his monthly commission in dollars
32. The number of degrees in an interior angle of a regular polygon is $\frac{(n - 2) \times 180}{n}$, where n is the number of sides (and the number of interior angles) of the polygon. Which of these is represented by the quantity $(n - 2) \times 180$?
- A. the number of degrees in a triangle
 - B. the number of triangles in a regular polygon
 - C. the sum of the interior angles of a regular polygon
 - D. the product of the interior angles of a regular polygon