#91A

Homework

Unit 10- Extra Equivalent Exponential Practice

Name: _____ **Date:** _____

1. The growth of a certain organism can be modeled by $C(t) = 10(1.029)^{24t}$, where $C(t)$ is the total number of cells after t hours. Which function is approximately equivalent to $C(t)$?

   A. $C(t) = 240(.083)^{24t}$

   B. $C(t) = 10(.083)^t$

   C. $C(t) = 10(1.986)^t$

   D. $C(t) = 240(1.986)^{\frac{t}{24}}$

2. Which scenario represents exponential growth?

   A. A water tank is filled at a rate of 2 gallons/minute.

   B. A vine grows 6 inches every week.

   C. A species of fly doubles its population every month during the summer.

   D. A car increases its distance from a garage as it travels at a constant speed of 25 miles per hour.

3. A computer application generates a sequence of musical notes using the function $f(n) = 6(16)^n$, where n is the number of the note in the sequence and $f(n)$ is the note frequency in hertz. Which function will generate the same note sequence as $f(n)$?

   A. $g(n) = 12(2)^{4n}$ B. $h(n) = 6(2)^{4n}$

   C. $p(n) = 12(4)^{2n}$ D. $k(n) = 6(8)^{2n}$

4. Anne invested \$1000 in an account with a 1.3% annual interest rate. She made no deposits or withdrawals on the account for 2 years. If interest was compounded annually, which equation represents the balance in the account after the 2 years?

   A. $A = 1000(1 - 0.013)^2$

   B. $A = 1000(1 + 0.013)^2$

   C. $A = 1000(1 - 1.3)^2$

   D. $A = 1000(1 + 1.3)^2$

5. Jill invests \$400 in a savings bond. The value of the bond, $V(x)$, in hundreds of dollars after x years is illustrated in the table below.

x	$V(x)$
0	4
1	5.4
2	7.29
3	9.84

   Which equation and statement illustrate the approximate value of the bond in hundreds of dollars over time in years?

   A. $V(x) = 4(0.65)^x$, and it grows.

   B. $V(x) = 4(0.65)^x$, and it decays.

   C. $V(x) = 4(1.35)^x$, and it grows.

   D. $V(x) = 4(1.35)^x$, and it decays.

6. The number of bacteria grown in a lab can be modeled by computations. $P(t) = 300 \cdot 2^{4t}$, where t is the number of hours. Which expression is equivalent to $P(t)$?

   A. $300 \cdot 8^t$ B. $300 \cdot 16^t$

   C. $300^t \cdot 2^4$ D. $300^{2t} \cdot 2^{2t}$

7. The population of a city can be modeled by $P(t) = 3810(1.0005)^{7t}$, where $P(t)$ is the population after t years. Which function is approximately equivalent to $P(t)$?

A. $P(t) = 3810(0.1427)^t$

B. $P(t) = 3810(1.0035)^t$

C. $P(t) = 26{,}670(0.1427)^t$

D. $P(t) = 26{,}670(1.0035)^t$

8. If $f(x) = 2(3^x) + 1$, what is the value of $f(2)$?

A. 13 B. 19 C. 37 D. 54

9. A laboratory technician used the function $t(m) = 2(3)^{2m+1}$ to model her research. Consider the following expressions:

I. $6(3)^{2m}$ II. $6(6)^{2m}$ III. $6(9)^m$

The function $t(m)$ is equivalent to

A. I, only B. II, only

C. I and III D. II and III

10. In the equation $A = P(1 \pm r)^t$, A is the total amount, P is the principal amount, r is the annual interest rate, and t is the time in years. Which statement correctly relates information regarding the annual interest rate for each given equation?

A. For $A = P(1.025)^t$, the principal amount of money is increasing at a 25% interest rate.

B. For $A = P(1.0052)^t$, the principal amount of money is increasing at a 52% interest rate.

C. For $A = P(0.86)^t$, the principal amount of money is decreasing at a 14% interest rate.

D. For $A = P(0.68)^t$, the principal amount of money is decreasing at a 68% interest rate.

11. In an organism, the number of cells, $C(d)$, after d days can be represented by the function $C(d) = 120 \cdot 2^{3d}$. This function can also be expressed as

A. $C(d) = 240^{3d}$ B. $C(d) = 960 \cdot 2^d$

C. $C(d) = 120 \cdot 6^d$ D. $C(d) = 120 \cdot 8^d$

12. Mike uses the equation $b = 1300(2.65)^x$ to determine the growth of bacteria in a laboratory setting. The exponent represents

A. the total number of bacteria currently present

B. the percent at which the bacteria are growing

C. the initial amount of bacteria

D. the number of time periods

13. The expression $300(4)^{x+3}$ is equivalent to

A. $300(4)^x(4)^3$ B. $300(4^x)^3$

C. $300(4)^x + 300(4)^3$ D. $300^x(4)^3$