#91A

Homework

Unit 10- Extra Equivalent Exponential Practice

Name: Key **Date:** ____________

multiplying = original as 1 base w/ 2 exponent inside that

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 $C(t)$?

$C(t) = 10(1.029^{24})^{t}$

$C(t) = 10(1.986)^{t}$

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. $k(n) = 6(8)^{2n}$

A) $g(n) = 12(2)^{4n}$
$g(n) = 12(2^{4})^{n}$
$g(n) = 12(16)^{n}$

B) $h(n) = 6(2)^{4n}$
$h(n) = 6(2^{4})^{n}$
$h(n) = 6(16)^{n}$

C) $p(n) = 12(4)^{2n}$
$p(n) = 12(4^{2})^{n}$
$p(n) = 12(16)^{n}$

D) $k(n) = 6(8)^{2n}$
$k(n) = 6(8^{2})^{n}$
$k(n) = 6(64)^{n}$

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?

$A = P(1+r)^{n}$

$A = 1000(1+1.3\%)^{2}$

$A = 1000(1+.013)^{2}$

$A = 1000($

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.

Exponential $y = a \cdot b^{x}$

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

$a \rightarrow$

$\frac{5.4}{4} = 1.35$

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. $300^{2t} \cdot 2^{2t}$

$P(t) = 300 \cdot 2^{4t}$

$P(t) = 300 \cdot 16^{t}$

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 $P(t)$?

→ exponents multiplied = originally 1 base with 1 exponent inside + 1 exponent outside

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

B. $P(t) = 3810(1.0035)^t$ $P(t) = 3810(1.0005^7)^t$

simplify

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

D. $P(t) = 26{,}670(1.0035)^t$ $P(t) = 3810(1.0035)^t$

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

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

$f(2) = 2(3^2) + 1$

$f(2) = 2(9) + 1$

$f(2) = 18 + 1$

$f(2) = 19$

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

I. $6(3)^{2m}$ $6\cdot(3^2)^m$ $6\cdot 9^m$ II. $6(6)^{2m}$ $6\cdot(6^2)^m$ $6\cdot 36^m$ 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

$t(m) = 2(3)^{2m+1}$ ← addition of exponents = original was same bases being multiplied

$t(m) = 2(3)^{2m}\cdot(3)^1$

$t(m) = 2(3^2)^m(3)^1$

$t(m) = 2(9)^m\cdot 3$

$t(m) = 6\cdot 9^m$

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. $25\% = .25$ $1 + .25 = 1.25$

B. For $A = P(1.0052)^t$, the principal amount of money is increasing at a 52% interest rate. $52\% = .52$ $1 + .52 = 1.52$

C. For $A = P(0.86)^t$, the principal amount of money is decreasing at a 14% interest rate. $14\% = .14$ $1 - .14 = .86$

D. For $A = P(0.68)^t$, the principal amount of money is decreasing at a 68% interest rate. $68\% = .68$ $1 - .68 = .32$

* Any base over 1 = increasing

* Any base under 1 = decreasing

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

$C(d) = 120\cdot(2^3)^d$

$C(d) = 120\cdot 8^d$

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 R

C. the initial amount of bacteria P

D. the number of time periods X

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

exponents being added means original was same bases being multiplied
* look for same bases

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

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