GSE Algebra 1 Unit 3 - MODELING AND ANALYZING EXPONENTIAL FUNCTIONS EOC Review

Name: _____ Block: _____

1. Each week, Tim wants to increase the number of sit-ups he does daily by 2 sit-ups . The first week, he does 15 sit-ups each day. Write an explicit function in the form f(n) = mn + b to represent the number of sit-ups, f(n), Tim does daily in week n.

2. An amount of $1,000 is deposited into a bank account that pays 4% interest compounded once a year. If there are no other withdrawals or deposits, what will be the balance of the account after 3 years?

3. The temperature of a large tub of water that is currently at 100° decreases by about 10% each hour.

Write an explicit function in the form f(n) = a · bn to represent the temperature, f(n), of the tub of water in n hours.

4. A population of bacteria begins with 2 bacteria on the first day and triples every day. The number of bacteria after x days can be represented by the function $P(x) = 2(3)^x$.

a. What is the common ratio of the function?

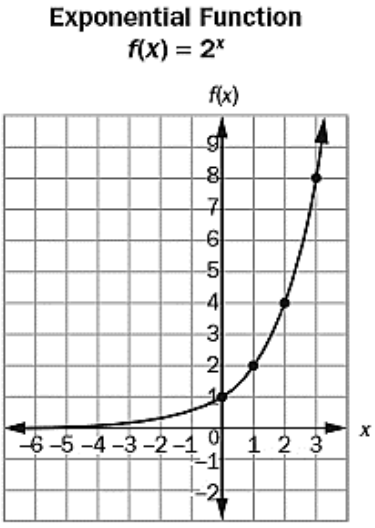
b. What is a_1 of the function?

c. Write a recursive formula for the bacteria growth.

d. What is the bacteria population after 10 days?

5. The function $f(n) = -(1 - 4n)$ represents a sequence. Create a table showing the first five terms in the sequence. Identify the domain and range of the function

6. Consider the graph of $f(x) = 2^x$.



Domain:

Range:

x-intercept:

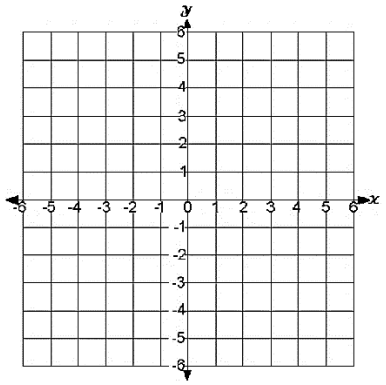
y-intercept:

Increasing:

Decreasing:

Asymptote:

7. Graph $f(x) = 4^x - 5$



1. Which function represents the sequence

n	1	2	3	4	5	...
a_n	3	10	17	24	31	...

A . f(n) = n + 3
B . f(n) = 7n – 4
C . f(n) = 3n + 7
D . f(n) = n + 7

1. _____

2. Which function represents this sequence?

n	1	2	3	4	5	...
a_n	6	18	54	162	486	...

A . $f(n) = 3^{n-1}$
B . $f(n) = 6^{n-1}$
C . $f(n) = 3(6^{n-1})$
D . $f(n) = 6(3^{n-1})$

2. _____

3. The points (0, 1), (1, 5), (2, 25), and (3, 125) are on the graph of a function . Which equation represents that function?

A . $f(x) = 2^x$
B . $f(x) = 3^x$
C . $f(x) = 4^x$
D . $f(x) = 5^x$

3. _____

4. A certain population of bacteria has an average growth rate of 2% . The formula for the growth of the bacteria's population is $A = P_0 \cdot 1.02^t$, where P_0 is the original population and t is the time in hours .

If you begin with 200 bacteria, about how many bacteria will there be after 100 hours

A . 7
B . 272
C . 1,478
D . 20,000

4. _____

5. Look at the sequence in this table .

n	1	2	3	4	5	...
a_n	−1	1	3	5	7	...

Which function represents the sequence?
A . $a_n = a_{n-1} + 1$
B . $a_n = a_{n-1} + 2$
C . $a_n = 2a_{n-1} - 1$
D . $a_n = 2a_{n-1} - 3$

5. _____

6. Consider this pattern .

Which function represents the sequence that represents the pattern?

A . $a_n = a_{n-1} - 3$
B . $a_n = a_{n-1} + 3$
C . $a_n = 3a_{n-1} - 3$
D . $a_n = 3a_{n-1} + 3$

6. _____

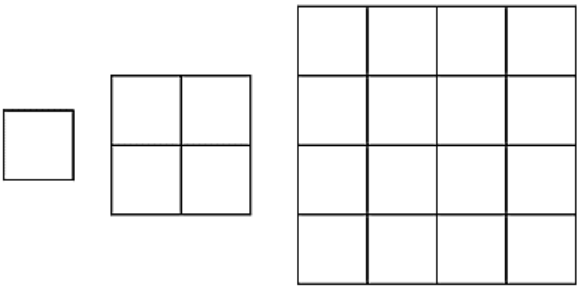
7. Which explicit formula describes the pattern in this table?

d	C
2	6.28
3	9.42
5	15.70
10	31.40

A . $d = 3.14 \cdot C$
B . $3.14 \cdot C = d$
C . $31.4 \cdot 10 = C$
D . $C = 3.14 \cdot d$

7. _____

8. Consider this pattern .



Which function represents the sequence that represents the pattern?

A . $a_n = (4)^{n-1}$
B . $a_n = (4)^{a_n - 1}$
C . $a_n = (a_n)(4)^{n-1}$
D . $a_n = (a_n)^4$

8. _____

9. Which function is modeled in this table?

x	f(x)
1	1000
2	800
3	640
4	512

A . $1{,}250(0.80)^x$
B . $1{,}250(0.20^x)$
C . $1{,}000(0.80)^x$
D . $1{,}000(0.20)^x$

9. _____

10. Which explicit formula describes the pattern in this table?

A . $C = 6d$
B . $C = d + 6$
C . $C = 6^d$
D . $C = d^6$

d	C
0	1
1	6
2	36
3	216

10. _____

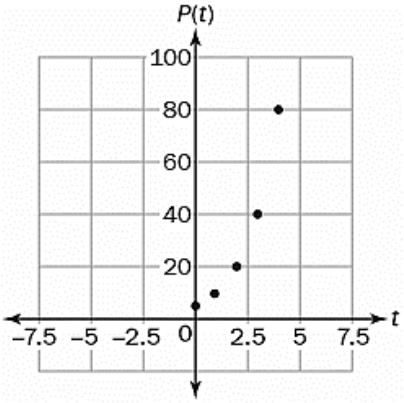
11. If $f(12) = 100(0.50)^{12}$, which expression gives f(x)?

A . $f(x) = 12^x$
B . $f(x) = 100(0.50)^x$
C . $f(x) = 100(x)^{12}$
D . $f(x) = 100(12)^x$

11. _____

12. A population of squirrels doubles every year . Initially, there were 5 squirrels . A biologist studying the squirrels created a function to model their population growth: P(t) = 5(2t), where t is the time in years . The graph of the function is shown

What is the range of the function?
A . any real number
B . any whole number greater than 0
C . any whole number greater than 5
D . any whole number greater than or equal to 5

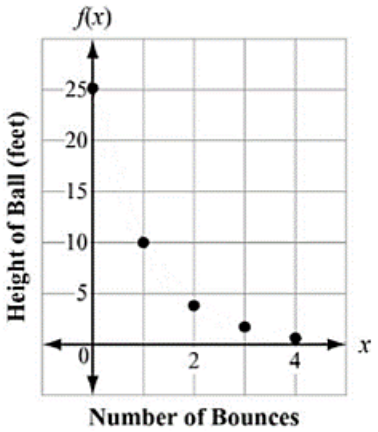


12. _____

13. The function graphed on this coordinate grid shows f(x), the height of a dropped ball in feet after its xth bounce .

On which bounce was the height of the ball 10 feet?

A . bounce 1
B . bounce 2
C . bounce 3
D . bounce 4



13. _____