

Exponential Functions - Unit 10 Practice Test

Name: Key

Date: _____

1. What is the equation of the function represented by this table of values?

x	-2	-1	0	1	2
y	$\frac{3}{25}$	$\frac{3}{5}$	3	15	75

- A. $y = 5x + 3$ B. $y = 12x + 3$
 C. $y = 3 \cdot 5^x$ D. $y = 5 \cdot 3^x$

2. In 1984, the population of Greensboro, N.C. was 197,910. According to the U.S. Census Bureau, Greensboro has been growing at the rate of 6.9% annually since 1984. What equation models the population of Greensboro t years after 1984?

- A. $y = 197,910(1 + 0.69)^t$
 B. $y = 197,910(1 + 69)^t$
 C. $y = 197,910(1 + 6.9)^t$
 D. $y = 197,910(1 + 0.069)^t$

3. Bacteria in a culture are growing exponentially with time, as shown in the table below.

Bacteria Growth

Day	Bacteria
0	100
1	200
2	400

Which of the following equations expresses the number of bacteria, y , present at any time, t ?

- A. $y = 100 + 2^t$ B. $y = (100) \cdot (2)^t$
 C. $y = 2^t$ D. $y = (200) \cdot (2)^t$

4. Which equation best fits the data in the given table?

Number of Half-Lives	Remaining Amount of Substance (in grams)
0	4,000
1	2,000
2	1,000
3	500
4	250
5	125
6	62.5

- A. $y = 4,000(\frac{1}{2})^x$ B. $y = 2,000(\frac{1}{2})^x$
 C. $y = \frac{1}{2}(4,000)^x$ D. $y = \frac{1}{2}(2,000)^x$

5. The population of a small town in North Carolina is 4,000, and it has a growth rate of 3% per year. Which expression can be used to calculate the town's population x years from now?

- A. $3(4,000)^x$ B. $4,000(1.03)^x$
 C. $4,000x^{1.03}$ D. $4,000x^3$

6. A girl drops a ball from a height of 10 feet. Each time the ball hits the ground, it bounces to $\frac{2}{3}$ its previous height. Which equation gives y , the height of the ball after x bounces?

- A. $y = 10^{\frac{2}{3}x}$ B. $y = 10(\frac{2}{3})^x$
 C. $y = \frac{2}{3}(10)^x$

$$y = 2000(1 - .10)^t$$

$$y = 2000(.9)^t$$

7. A \$2,000 bicycle depreciates at a rate of 10% per year.

After how many years will it be worth less than \$1,000?

- A. 5 years **B. 7 years**
 C. 10 years D. 100 years

used table in calculator

8. The student population in the Greenville school system is increasing about 10% each year. This year there are 3120 students in the Greenville school system. If this trend continues, which of the following is closest to the number of students who will be in this school system 3 years from now?

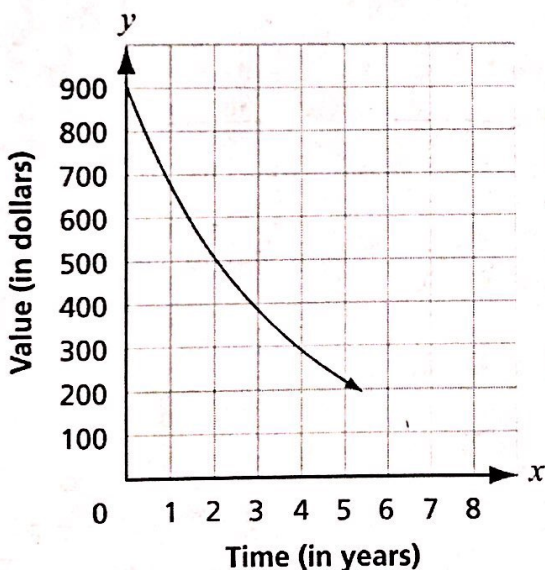
$$y = 3120(1 + .1)^t$$

$$y = 3120(1.1)^3$$

- A. 3400 B. 4000 **C. 4200** D. 9400

9.

Value of the Computer



Dan bought a new computer for \$900. Each year, the value of the computer decreased by 25% of the previous year's value. At this rate, what can Dan expect the approximate value of the computer to be after 8 years?

- A. \$84 **B. \$90** C. \$100 D. \$113

$$y = 900(1 - .25)^t$$

$$y = 900(.75)^8$$

$$y = 90$$

used table in calculator

10. A new automobile is purchased for \$20,000. If $V = 20,000(0.8)^x$ gives the car's value after x years, about how long will it take for the car to be worth half its purchase price?

worth 10,000?

- A. 3 years** B. 4 years
 C. 5 years D. 6 years

11. Which rule applies to the table below?

x	-2	-1	0	1	2
y	81	27	9	3	1

- A. $y = 9 \cdot 3^x$ B. $y = 3 \cdot 9^x$
 C. $y = 3 \cdot (\frac{1}{9})^x$ **D. $y = 9 \cdot (\frac{1}{3})^x$**

12. How will the graph of the function $f(x) = 3^x$ translate when the function is changed to $f(x) = 3^{(x-2)}$?

- A. 2 units up B. 2 units left
C. 2 units right D. 2 units down