

Math 1
Unit 7 - Exponential Functions Test Review

Name Key

1. Does the following represent growth or decay? $y = .5(1.8)^x$

Growth

2. Does the following function represent growth or decay? $y = 5(3/4)^x$

Decay

3. Does the table represent a linear or exponential function? **YES** OR NO

x	1	2	3	4
y	-5	-80	-405	-1280

4. Which of the following correctly describes this equation? $f(x) = 3000(0.75)^x$

- a. Increasing by 75% b. Decreasing by 75%
 c. Increasing by 25% **d. Decreasing by 25%**

5. Which of the following correctly describes this equation? $y = 1000(1.10)^x$

- a. Increasing by 10%** b. Decreasing by 10%
 c. Increasing by 110% d. Decreasing by 110%

6. Suppose your bank account can be modeled by the function $y = 1000(1.10)^x$. What is your interest rate?

- a. 10%** b. 90% c. 110% d. 1.1%

7. Decide which of the following functions represent the following situations:

- Linear Increase** **Linear Decrease**
Exponential Growth **Exponential Decay**

a. Shane earns \$10 for the first A on his report card. For every additional "A", his reward triples.

Exp. Growth

b. In the Great Depression, a lot of people stored money under their mattresses. Suppose someone put \$50 under their mattress every month. What type of function would model their money saved over time?

Linear Growth

c. Every year, 15% of Sudan's population is killed due to malaria. What type of function would represent Sudan's population over time without taking into consideration natural births and deaths?

Exp. Decay

d. The temperature decreases by an average of 1 degree each day after the start of fall. What type of function would model the temperature over the fall and winter seasons?

Linear Decrease

8. Which scenario would best be modeled by an exponential decay function?

- a. the salary of a worker who makes \$12 every hour
- b. the population of a town that is doubling every decade.
- c. the population of a virus that is reducing in number by half every hour
- d. going to the store and using a 12% off coupon

9. Diana did an experiment to compare two methods of cooling an object.

The results are shown in the table below:

Time	Method 1	Method 2
5	50	50
10	25	45
15	12.5	42
20	6.25	38
25	3.125	35

Which statement best describes her results?

- a. The temperature using Method 1 changed exponentially
- b. The temperature using Method 2 changed exponentially
- c. The temperature using Method 1 changed at a constant rate
- d. The temperature using Method 2

10. The following sequence shows how many bushes the Lovejoys planted each year: 625, 125, 25, 5
Which formula can be used to determine the number of bushes the Lovejoys will plant next year, NEXT, if the number of bushes planted this year, NOW, is known?

- a. $NEXT = 5 * NOW$
- c. $NEXT = 1/5 * NOW$
- b. $NEXT = NOW - 500$
- d. $NEXT = 1/4 * NOW$

11. Keisha's initial investment of \$7500 has an interest rate of 7% each year. Which of the following is the correct NOW-NEXT rule?

- a. $NEXT = 1.07NOW$
- b. $NEXT = .93NOW$
- c. $NEXT = .07NOW$
- d. $NEXT = NOW + .07$

12. A population of 1,250 cheetahs decreases by 11% per year.

a. How many cheetahs will there be in the population after 4 years?

$$1250(.89)^4$$

$$784$$

b. How many years until there are at most 300 cheetahs?

$$300 = 1250(.89)^x$$

$$x = 12 \text{ years}$$

13. Suppose a population of 500 crickets doubles in size every month. How many crickets will there be after 1 year?

$$500(2)^{12}$$

$$2,048,000$$

Operator: PaintPath
Error: InsufficientMemory
PCL XL error

14. The population of a town is modeled by the function $P(t) = 11,000 (0.85)^{1/3t}$ where t is the number of years since 2010. By what approximate percent rate is the population of the town decreasing per year?

.947 5.3%

15. The population of a town is modeled by the function $P(t) = 32,000 (0.95)^{4/5t}$ where t is the number of years since 2010. By what approximate percent rate is the population of the town decreasing per year?

a. 96%

b. 24%

c. 5%

d. 4%

.959

.041

16. A new boat is purchased for \$8000 and depreciates at 20% each year. About how long will it take for the car to be worth half its purchase price?

a. 2 years

b. 4 years

c. 3 years

d. 5 years

$$8000(.80)^x = 4000$$

17. A condo was purchased for \$88,500 in 2000. Its value appreciates 6.5% annually. The function $y = 88.5(1.065)^x$ gives the condo's value (in thousands of dollars) after x years. When will it be worth \$100,000?

a. 1 year

b. 2 years

c. 39 years

d. 112 years

18. When Matthew was 20 years old, he rich uncle left him \$18,000 which he put in a bank account to save up to buy a house. The bank account earns 4.5% annual interest. How much will there be after 21 years?

$$18,000(1.045)^{21}$$

\$45364.34

19. Scientists measure the total population of polar bears, y , each year in a refuge. They discovered an initial population of 78 polar bears and an increase of 9 bears each year. If x is the number of years after the initial observation, which equation *best* models the polar bear population?

a. $y = 9x + 78$

b. $y = 9(78)^x$

c. $y = 78x + 9$

d. $y = 78(9)^x$

20. Clara's and Michelle's parents started saving for college in 1998. Clara's college fund started with \$2500 and increases by \$500 each year. Michelle's college fund started with \$2500 and increases by 10% each year. *Approximately*, how many years will it take Michelle's college fund to first exceed Clara's college fund?

a. 5 years

b. 10 years

c. 15 years

d. 20 years

$$C = 2500 + 500x$$
$$M = 2500(1.10)^x$$

21. Jessie is given 2 salary options by her employer. The first option is a starting salary of \$30,000 that increases by \$600 each year she is with the company. The second option is a starting salary of \$30,000 that increases by 1.9% each year she is with the company. How many years will Jessie have to be with the company for the salary with the second option to be greater than the salary with the first option?

- a. 3 years **(b.) 7 years** c. 9 years d. 11 years
- #1 = $30,000 + 600x$
#2 = $30,000(1.019)^x$

22. The population of one type of algae can be modeled by the equation $P = 3(1.75)^t$, where t is the time in days. A second type of algae has a population modeled by the equation $P = 500 + 100t$, where t is the time in days. After approximately how many days are the populations equal?

- a. 4 days b. 5 days c. 10 days **(d.) 11 days**
- closest*

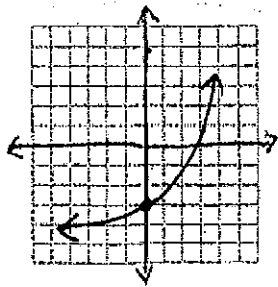
23. What is the y-intercept of 5^x ?

1

24. What is the y-intercept of the graph $y = 2(6)^x + 5$?

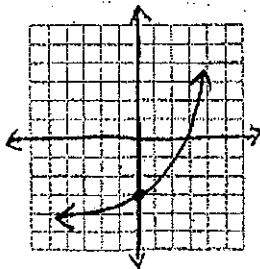
- a. 2 b. 6 c. 5 **(d.) 7**

25. The function $f(x) = 5(2)^x$ was replaced with $f(x) + k$, resulting in the function seen on the graph below. What is the value of k?



-8

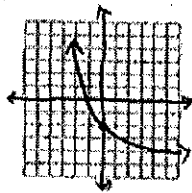
26. The function $f(x) = 2^x$ was replaced with $f(x) + k$, resulting in the function seen on the graph below. What is the value of k?



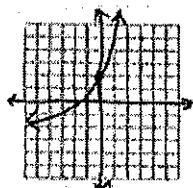
-4

27. Which is the graph of the function $f(x) = 4\left(\frac{1}{2}\right)^x - 2$

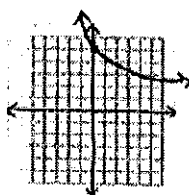
a.



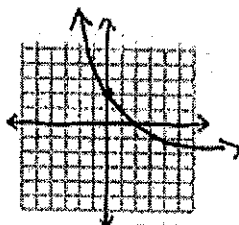
b.



c.



d.



28. $(-3m^2)(2mn^5)$

$-6m^3n^5$

29. $(-3x^3y^4)^2$

$9x^6y^8$

30. $7a^3b^0c^5$

$7a^3c^5$

31. x^5y^{-2}

$\frac{x^5}{y^2}$

32. $\frac{1}{3^{-2}}$

9

33. 6^{-2}

$\frac{1}{36}$

34. $(k^2)^4$

k^8

35. $(-3x^2)(6xy^4)$

$-18x^3y^4$

36. $5x^0$

5