Name SINGLETON Date

Unit 5: Exponential Functions Unit Review- ACTIVE

1. What is the y-intercept of the graph of

$$f(x) = \frac{1}{10}(5)^x - 3?$$

$\frac{-29}{10}$

2. The rule for a geometric sequence is

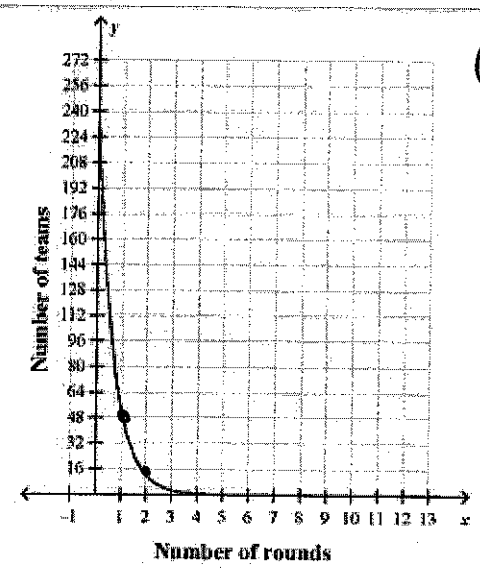
$$a_n = 150\left(\frac{1}{3}\right)^{n-1}$$

What is the seventh term in the sequence?

$\frac{50}{243} = \frac{25}{132}$

3. A basketball tournament starts out with 243 teams. ~~One~~ TWO third of the teams are eliminated after each round. What is the graph of the equation?

a.



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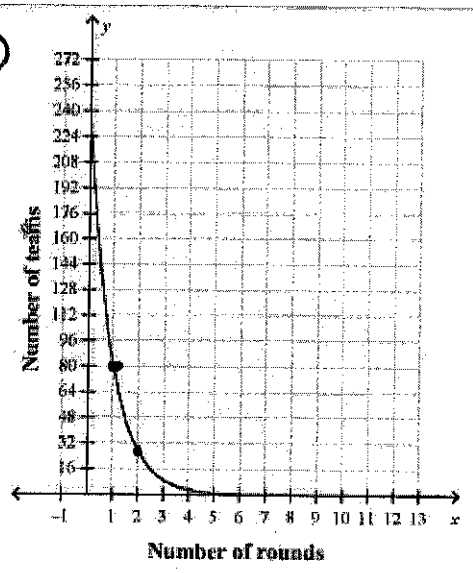

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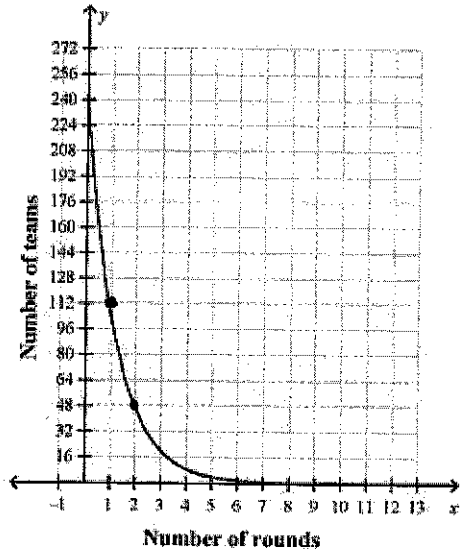

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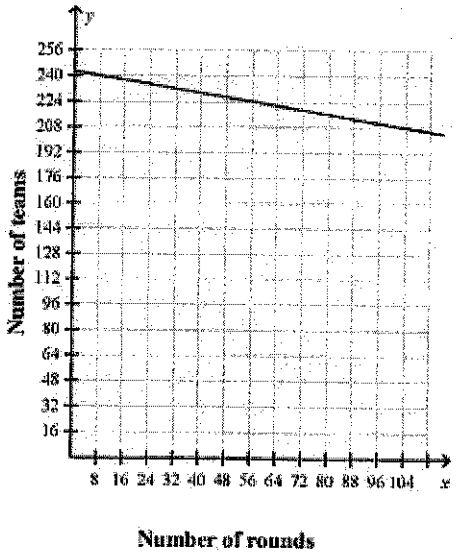


5. Which function shows exponential decay?

A. $f(x) = 2.3(-0.2)^x$ B. $f(x) = 2.3(1.2)^x$
C. $f(x) = 2.3(1.8)^x$ D. $f(x) = 2.3\ (0.8)^x$

6. Amy wrote the following sequence of numbers

-2, 1, 4, 7, 10

What expression was used to form the sequence when *n* is the term number?

A. 3n + 2 B. 3n - 2
C. 3n – 5 D. 3n + 5

7. What equation correctly models the relationship between hours passed, h, and the number of molecules present, m, as shown in the table?

Hours Passed	Number of Molecules
0	4
1	16
2	64
3	256
4	1024

$y = 4(4)^x$

8. Often times a tweet will be tweeted and then retweeted with the possible number of retweets growing exponentially. Sarina modeled this with the function $f(x)=4(3)^x$ where x represents the number of intervals in which the tweet was retweeted. Which statement about her function is true?

A. A tweet can be retweeted a maximum of 4 times.
B. There were 3 original tweets.
C. There are 4 times 3 or 12 retweets at each level.
(D.) At each interval, the number of retweets triples

9. The number of blades of grass y that remain after m minutes of mowing a lawn can be modeled by the equation $y = 10{,}530(0.85)^m$ What is the rate of decrease of this scenario?

.15

10. After a dose of flea medicine, the number of fleas decreases. If the equation $y = 450\left(\frac{2}{3}\right)^x$ models this situation, what value represents the original number of fleas?

450

11. Elizabeth invested $4,500 in an account that is compounded annually and pays an interest of 2.3% each year. By what factor is the investment increasing every year?

1.023

12. A car depreciates at a rate of 13% each year. If the original cost of the car was $42,000, what is the approximate value of the car at the end of 4 years?

$y = 42000(.87)^4$

$24,061.70

13. A stock loses half its value every week. If the stock was worth $160 starting out, what is it worth after 5 weeks at this rate of decline?

$y = 160(.5)^5$

$5.00

14. On the day that Marshall opened a money market account, he put in $100. If the value of the account doubles every year, how much would the account be worth in 15 years?

$y = 100(2)^{15}$

$3,276,800

15. The equation $y = 300(1.07)^x$ models the value of a limited edition watch after x years. Which statement is true about the value of the watch?

A. The value of the watch is decreasing by $300 each year.
B. The value of the watch is decreasing by 7% each year.
C. The value of the watch is growing by $300 each year.
(D.) The value of the watch is growing by 7% each year.

16. The Canton family wants to begin saving for a college fund. They initially deposit $75 into the account and it will grow at a rate of 14% annually. How much will the Canton family have saved after 18 years?

$y = 75(1.14)^{18}$

$793.14

17. The table below shows the results of an experiment with flowering trees using two different types of fertilizers, Type A and Type B. The number of blooms were measured weekly.

Expo. Lin.

Time (weeks)	Type A	Type B
0	2	4
1	6	9
2	18	14
3	54	19
4	162	24

(Type A: ·3 ·3 ·3 ·3; Type B: +5 +5 +5 +5)

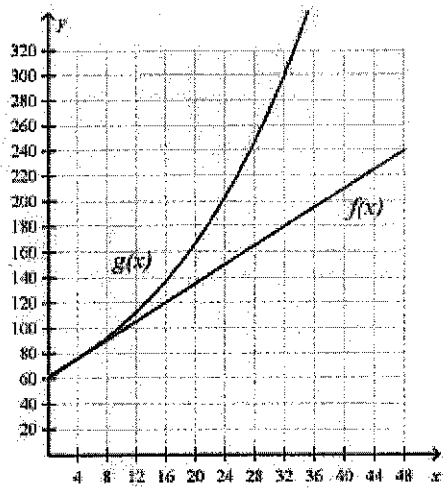
Which statement ***best*** describes the results?

A. Both trees treated with fertilizers Type A or Type B increased exponentially.
B. The tree with Type A fertilizer increased at a constant rate.
C. The tree with Type B fertilizer increased at a constant rate.
D. The tree with Type B fertilizer increased exponentially.

18. A town's population increases at a rate of 1.2% every year. The current population is 6,800 people. What equation models this scenario?

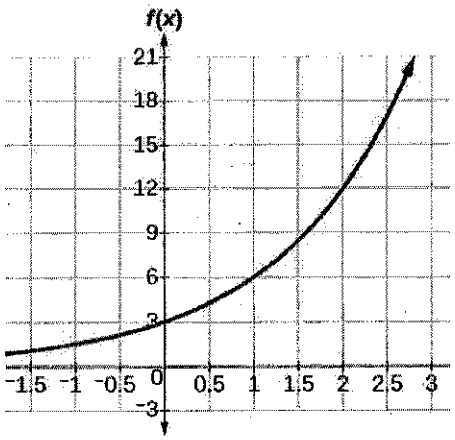
A. $y = 6{,}800(1.12)^x$
B. $y = 6{,}800(1.012)^x$
C. $y = 6{,}800(0.012)^x$
D. $y = 6{,}800(0.12)^x$

19. Which of the following statements is true about the functions f(x) and g(x) shown below?



A. The rate of change of the function g(x) is always greater than the rate of change of the function f(x)
B. The rate of change of the function g(x) will eventually be greater than the rate of change of the function f(x)
C. The rate of change of the function g(x) is never greater than the rate of change of the function f(x)
D. The rate of change of an exponential function cannot be determined.

20. Given the exponential function graphed below, which linear function has the same y-intercept?



A. $2x + y = -12$ $y = -2x - 12$
B. $2x + 4y = 12$ $y = -\frac{1}{2}x + 3$
C. $x = 3$
D. $2x - 4y = 12$ $y = \frac{1}{2}x - 3$

21. Given $f(x) = 2{,}500\ (0.78)^x$ identify the decay factor.

.78

22. Each year the local recreation center sponsors a basketball free throw tournament. Play starts with 156 participants. During each round, a quarter of the players are eliminated. Write an exponential equation to describe this situation.

$y = 156\left(\frac{3}{4}\right)^x$

23. If $y = 57(1.18)^x$, what is the percent rate of change of y for each unit of x?

18%