

Name _____ Algebra Exponential TEST REVIEW

Your test has 28 questions: 20 multiple choice and 8 free response. 5 are properties of exponents, 6 are sequences and series, 5 are graphing/domain and range, and 12 are problem solving/interpreting problems.

1. _____

2. Evaluate $y = -2(4)^x$ for $x = -2$

and $x = 3$. No decimals!

x	y
0	25
1	26
2	27
3	28
4	29

x	y
0	1
1	2
2	4
3	8
4	16

What is the first whole number value of x where the y -value in the table on the right will surpass the y -value in the table on the left?

- A. $x = 3$
- B. $x = 4$
- C. $x = 5$
- D. $x = 6$

3. Shawn decides to buy a motorcycle. 5 years later he decides to sell it. He uses the following equation to determine his selling price:

$$Y = 4500(.83)^5$$

Describe what each value in the equation represents:

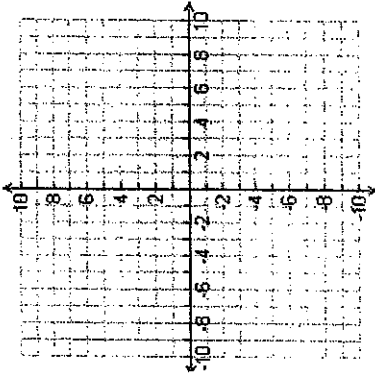
4500 _____

.83 _____

5 _____

4. Make a table of values and graph $f(x) = 2(\frac{1}{2})^x$ and $h(x) = 0.5 \cdot 2^x$. Where do they intersect?

X	-2	-1	0	1	2
F(x)					
H(x)					



5. You have \$300 in birthday money to put into a savings account. You want to use the money in 4 years. Which bank is the best option?

Meerhaeghe Money Maker: 4% compounded annually
Utica bank and trust: 5% compounded biannually
Chieftain Credit Union: 5% compounded quarterly
Bank of Byron: 4.8% compounded monthly

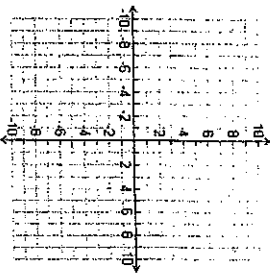
6. graph $y = 2(0.4)^x$

X	-2	-1	0	1	2
Y					

What is the domain? _____

What is the range? _____

What is the asymptote? _____



7. A. You build a new home for \$125,000. It increases in value each year by approximately 2%. You use the equation $y = 125000(1.02)^x$ to keep track of the value of your home.

What is the domain of the graph? _____

What is the range of the graph? _____

B. You buy the X Box 1 for your brother. It cost \$300. It loses around 7% of its value each year. You use the function $y = 300(.93)^x$ to keep track of its value.

What is the domain of the graph? _____

What is the range of the graph? _____

For these problems, consider the fact that your purchases were made the exact day that the item came out.

C. Consider the function $y = 2(3)^x$. There are no constraints on the graph.

What is the domain of the graph? _____

What is the range of the graph? _____

8. Solve for x:

A. $5^6 = 25^x$

B. $3^{2x} = 9^4$

C. $4^x = 2^6$

D. $2^x = 16$

9. Label each situation as exponential growth, exponential decay, or linear: (give the equation for D-H)

A. $y = 7(0.1)^x$ _____

B. $y = 7x + 1$ _____

C. $y = 0.1(7)^x$ _____

D. Increase the number of sit ups done each day by 5 _____

E. Increase the number of miles run each week by 10% _____

F. _____

X	-2	-1	0	1	2
Y	.125	.25	.5	1	2

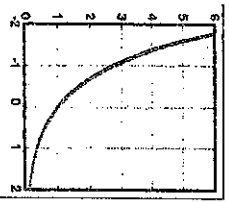
G.

X	-2	-1	0	1	2
Y	7.8	6.25	5	4	3.2

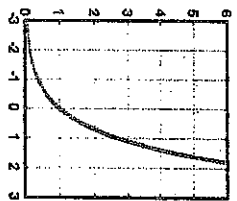
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X	-2	-1	0	1	2
Y	2.7	2.95	3.2	3.45	3.7

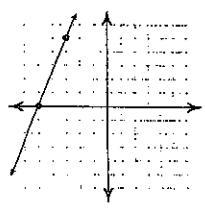
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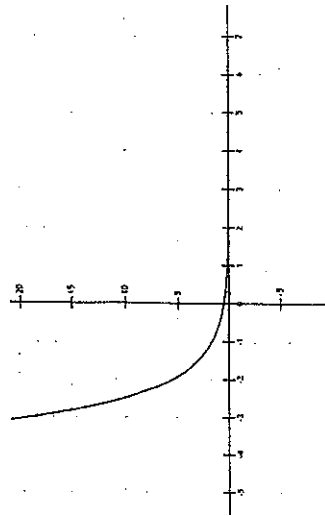


K.



10. Evaluate $f(x) = 4^x$ for the domain $\{-3, -2, -1, 0, 1, 2, 3\}$. No decimals!

11.



y-intercept _____ x-intercept _____ growth or decay? _____

12. A certain kind of bacteria in a lab culture triples in number every 30 minutes. Suppose a culture started with 21 bacteria cells.

- A. Write an equation: _____
- B. How many bacteria will there be in 2 hours? _____
- C. How many bacteria were there 1 hour ago? _____

13. The half-life of mystery substance 123 is 2 hours. You have 50 mg of mystery substance 123.

- A. Write an equation: _____
- B. How many mg of mystery substance 123 is there in 6 hours? _____
- C. How many mg of mystery substance 123 is there in 15 hours? _____

14. A town has 200 people and it is growing by 24% each year.

- A. write an equation: _____
- B. How many people will there be in 6 years? _____
- C. How many people will there be in 15 years? _____
- D. How many people were there 3 years ago? _____

15. A town has 500 people but is losing 5% of its population each year.

- A. write an equation: _____
- B. How many people will there be in 6 years? _____
- C. How many people will there be in 15 years? _____
- D. How many people were there 3 years ago? _____

16. $y = 40(1.09)^x$

Is this growth or decay? _____
 What is the growth/decay factor? _____

17. $y = 20(0.77)^x$

Is this growth or decay? _____
 What is the growth/decay factor? _____

18. Write recursive and explicit formulas for the following sequence, then find the 30th term:

7, 10, 13, 16, ...

Recursive _____ explicit _____ 30th _____

19. Write recursive and explicit formulas for the following sequence, then find the 15th term

4, 6, 9, 13, 5, ...

Recursive _____ explicit _____ 15th _____

20. Is the sequence arithmetic or geometric? How can you tell? Find the next four terms.

A. 25, 50, 75, 100, ...

B. 25, 50, 100, 200, ...

21. $(3x)^0$

22. $\frac{9x^4y}{12z^2}$

23. $(5a^4bc^6d^{-5})^2$

24. Rewrite with a single exponent:

A. $4x^2y^6z^8$

B. $125x^6y^{15}z^3$

25. Identify the coefficient, base, and exponent:

A. $50(2)^x$

B. $9x^3$

C. $-2(0.5)^4$

26. $(5x^4)^2(2x^5)^3$

In addition to this study guide, study your notes! You can also take the online quizzes on PHSchool.com (aek-0099) for lessons 8.1, 8.3, 8.4, 8.5, 8.7, 8.8