Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Algebra Exponential TEST REVIEW

1. \_\_\_\_\_\_\_ 2. Evaluate y = -2(4)x for x = -2

 and x = 3. No decimals!

3. Shawn buys 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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the decay factor? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the rate of depreciation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Make a table of values and graph f(x) = 2($\frac{1}{4}$)x and h(x) = 0.5$⋅$2x Where do they intersect? (estimate, then use a graphing calculator for the exact value)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Growth or decay? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

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 situation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the range of the situation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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 situation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the range of the situation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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. 56 = 25x B. 32x = 94 C. 4x = 26 D. 2x = 16

9. Solve for x: (no decimals!)

A. $ 3^{5x-2}$ = $27^{4x+3}$ B. $2^{6x}$ = $32^{5x-1}$

10. Label each situation as exponential growth, exponential decay, or linear:

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 |

H.

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

I. J. K.

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

12. g(x) is linear and h(x) is exponential. Write a rule for each function.

g(x) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ h(x) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| g(x) | 9 | 10.5 | 12 | 13.5 | 15 | 16.5 | 18 |
| h(x) | 3 | 4.5 | 6.75 | 10.125 | 15.1875 | 22.78125 | 34.171885 |

13.

y-intercept \_\_\_\_\_\_\_\_ x-intercept \_\_\_\_\_\_\_ growth or decay? \_\_\_\_\_\_\_\_\_

y = 5, x = \_\_\_\_\_\_ y = 10, x = \_\_\_\_\_\_\_\_

14**.** 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? \_\_\_\_\_\_\_\_\_\_\_\_

15**.** 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? \_\_\_\_\_\_\_\_\_

16. 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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

17**.** 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? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

18. y = 40(1.09)x

Is this growth or decay? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the growth/decay factor? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the percent of increase or decrease? \_\_\_\_\_\_\_\_\_\_\_\_

19**.** y = 20(0.77)x

Is this growth or decay? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the growth/decay factor? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the percent of increase or decrease? \_\_\_\_\_\_\_\_\_\_\_\_\_\_

20. (3x)0 21. $\frac{9x^{4}y}{12xy^{2}}$ 22. (5a4bc6d-5)2

23. rewrite with a single exponent:

A. 4x2y6z8 B. 125x6y15z3

24. identify the coefficient, base, and exponent:

A. 50(2)x B. 9x3 C. -2(0.5)4

25. (5x4)2(2x5)3

26. (mx)y 27. mx(my) 28. $\frac{m^{x}}{m^{y}}$

29. You get to choose between two allowance plans, but you may change the plan at any time.

Plan #1: $6 each week

Plan #2: $0.25 for the first week, and it will double each additional week.

You will not be spending any of the money!

1. How much will you receive at the end of the 5th week under

Plan #1 \_\_\_\_\_\_\_\_\_ Plan #2 \_\_\_\_\_\_\_\_\_\_

1. How much total will you have received at the end of the 5th week under

Plan #1 \_\_\_\_\_\_\_\_\_ Plan #2 \_\_\_\_\_\_\_\_\_\_

1. When should you switch plans? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

30. graph f(x) = -.8(3)x

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | -2 | -1 | 0 | 1 | 2 |
| y |  |  |  |  |  |

What is the domain? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the range? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the asymptote? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Growth or decay? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

