Algebra 1 Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 10 Review Guide Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Block:\_\_\_\_\_\_\_\_

**Exponential Functions Unit Review**

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| --- | --- | --- | --- | --- | --- |
| **Skill** | **Things to remember** | **Examples** | | | |
| 1. Determine if representations are exponential. Explain why or why not | Exponential Functions:  -Variable in exponent  -Constant Ratios  -Graph is a curve  Linear Functions:  -Constant differences  -Graph is a line | a. Determine if the points are exponential or linear:  a.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **x** | -3 | -2 | -1 | 0 | 1 | | **y** | 0.16 | 0.8 | 4 | 20 | 100 |   b. (-2, 5) (-1, 4) (0, 3) (1, 2) (2, 1) | | | b. Determine if the equations are linear or exponential:  a. y = 3x – 4  b. y = 22  c. y = 62x |
| 2. Determine if a function is exponential growth or decay and explain why. | 0 < b < 1: Decay  b > 1: Growth | a. | | b. | |
| c. What is the function growing by?  Y = 3(2)x | | d. What is constant ratio?  Y = 3(4.5)x | |
| 3. Graph an exponential function. | Create a table with values (5 points is a must) | a. Graph:  graph.bmp | | b. Graph:  graph.bmp | |
| 4. Describe the transformations of an exponential function. | **a** stretches or shrinks AND/OR reflects  **k** moves the function up and down.  **h** moves the function left and right.  The new asymptote is the line y = k. | a. Given the function  *f(x) = 2x* write a new equation after a transformation of left 7 and up 3. | | b. Given the function  g(x) = 2x, write a new equation after a transformation of right 9 and reflect across the x-axis. | |
| c. Describe the transformation  h(x) = 10x to k(x) = 4(10)x + 1 –5. | | d. Describe the transformation from a(x) to b(x).    b(x)  a(x) | |
| 5. Create equations from a graph or table | y = y-int(constant ratio)x | a. | | b. | |
| 6. Determine characteristics of exponential functions. |  | a.    Domain:  Range:  x-Intercept:  y-intercept:  Interval of Increase:  Interval of Decrease:  Asymptote:  End Behavior:    ROC from -2 to 0: | | b.    Domain:  Range:  x-Intercept:  y-intercept:  Interval of Increase:  Interval of Decrease:  Asymptote:  End Behavior:    ROC from -1 to 0: | |
| 7. Determine the y-intercept and asymptote from an equation | You can always substitute 0 in for x to find a y-intercept  Asymptote: y = k  No ‘k’ value, the asymptote is y = 0. | a. Determine the y-intercept and asymptote of the function y = 3(2)x. | | b. Determine the y-intercept and asymptote of the function  y = 4()x - 2. | |
| 8. Average Rate of Change |  | a. for x = -1 and x = 0 | | b. for [0, 5] | |
| 9. Determine the growth/decay factor and percent. | (1 + r) and (1 – r) represent the growth and decay factors  Percent is just the r value | a.  Determine if the function is growth or decay:  Factor:  Percent: | | b. y = 2(.84)x  Determine if the function is growth or decay:  Factor:  Percent: | |
| 10. Applications of exponential functions. |  | a. Duke deposits $2000 into a bank account that pays 5% interest compounded monthly. Find the balance in the account after 4 years.  Model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | b. The value of the Barbie Dream House is $125,000. This house is in a prime location and appreciates (increases in value) at a rate of 7% per year. How much will the Barbie Dream House be worth in 5 years?  Model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| c. A certain radioactive element decays at a rate of 21% per month. If the starting amount was 32 ounces, how much will be left after **1 year**?  Model: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | d. Michael is offered two jobs – Job A, which offers him a starting salary of $20,000 a year with a 5% raise each year he works there and Job B, which offers him a starting salary of $25,000, but only a 3% raise each year. Michael plans to work to work at the job for 7 years. Which job should he pick and why? | | |