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

Unit 4 Review Guide Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**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 | Image result for exponential grapha. Tell if the following are exponential decay, growth, reflected decay, or reflected growth  Image result for exponential graph reflected decay | | | b. Determine if the equations are linear or exponential:  a. y = 3x – 4  b. y = 2x -3  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. Y = 3(2)x | | d. Y = 3(1-.5)x | |
| **3. Graph an exponential function.** | Create a table with values and graph.  Remember to represent the asymptote as a dotted line. | a. Graph:  graph.bmp | | b. Graph:  graph.bmp | |
| **4. Describe the transformations of an exponential function.** | **a** stretches or shrinks AND 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. Determine characteristics of exponential functions.** |  | a.    Domain:  Range:  x-Intercept:  y-intercept:  Interval of Increase:  Interval of Decrease:  Asymptote:  End Behavior:    ROC over interval -2 to 0: | | b.    Domain:  Range:  x-Intercept:  y-intercept:  Interval of Increase:  Interval of Decrease:  Asymptote:  End Behavior:    ROC over interval -1 to 0: | |
| **6. 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. | |
| **7. Determine the growth/decay factor and Rate.** | (1 + r) and (1 – r) represent the growth and decay factors | a.  Determine if the function is growth or decay:  For example:  Factor: 1.25  Rate: 0.25 or 25% | | b. y = 2(.84)x  Determine if the function is growth or decay:  Factor:  Rate: | |
| **8. Applications of exponential functions.** |  | a. Luke Duke deposits $2000 into a bank account that pays 5% interest compounded monthly. Find the balance in the account after 4 years.  Equation:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  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?  Equation:  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  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**?  Equation: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **DONT DO THIS PROBLEM**  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? | | |
| **9. Solving Exponential Functions** | * Must have SAME base * Set exponents = (don’t forget to distribute) * Solve for x | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | |

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| **10. Geometric Sequences** | Geometric Explicit  Formula: | Tell if the following is Geometric or Arithmetic  a. 8, 5, 2, -1…  b. 2, 6, 18, 54…  Create an Explicit formula and then use it to find a certain term.  c. -81, 27, -9, 3, -1  Explicit formula:  a8 =  d. 4, 12, 36, 108,…  Explicit formula:  a9 =  Joe sells coffee at his work place and has recorded his weekly sales below.   |  |  | | --- | --- | | week | Sales | | 1 | 50. 30 | | 2 | 62.10 | | 3 | 76.67 |   Explicit formula:  If the same trend continues, how much will he   make in week 7? |