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 curveLinear Functions:-Constant differences-Graph is a line | Image result for exponential grapha. Tell if the following are exponential decay, growth, reflected decay, or reflected growthImage result for exponential graph reflected decay | b. Determine if the equations are linear or exponential:a. y = 3x – 4b. y = 2x -3c. y = 62x |
| **2. Determine if a function is exponential growth or decay and explain why.**  | 0 < b < 1: Decayb > 1: Growth | a.  | b.  |
| c. Y = 3(2)x | d. Y = 3(1-.5)x |
| **3. Graph an exponential function.** | $$y=ab^{x}$$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-interceptAsymptote: y = kNo ‘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($\frac{1}{2}$)x - 2. |
| **7. Determine the growth/decay factor and Rate.** | (1 + r) and (1 – r) represent the growth and decay factors | a. $y=3\left(1.25\right)^{x}$Determine if the function is growth or decay:For example: Factor: 1.25Rate: 0.25 or 25% | b. y = 2(.84)x Determine if the function is growth or decay:Factor:Rate: |
| **8. Applications of exponential functions.** | $$y=p(1+r)^{t}$$$$y=p(1-r)^{t}$$$$A=P\left(1+\frac{r}{n}\right)^{nt}$$ | 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 ExplicitFormula:   | Tell if the following is Geometric or Arithmetica. 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.

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| 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? |