**Algebra II Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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| **Unit: 5** | **Homework**: 2 |
| **Standard**: **Analyze functions using different representations*** **MGSE9-12.F.IF.7** Graph functions expressed algebraically and show key features of the graph both by hand and by using technology.
* **MGSE9‐12.F.IF.7e** Graph exponential and logarithmic functions, showing intercepts and end behavior.
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| **Essential Questions:** How can equations describe growth and decay situations? |
| **Key Words**: **exponential function, logarithmic function, inverse function, logarithm , base, asymptote, exponential growth, exponential decay**  |
| 1. When the base in an exponential function is between 0 and 1, the function shows \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_? | 2. Tell whether the function shows growth or decay. a)  b)  |
| 3. The amount of freight transported by rail in the United States was about 580 billion ton-miles in 1960 and has been increasing at a rate of 2.32% per year since then. |
| a) Write a function representing the amount of freight, in billions of ton-miles, transported annually (1960 = year 0).c) In what year would you predict that the number of ton-miles would have exceeded or would exceed 1 trillion (1000 billion)?  | b) |
| 4. Radon-222 is a gas that escapes from rocks and soil. It can accumulate in buildings and can be dangerous for people who breathe it. Radon-222 decays to polonium and eventually to lead.a) Find the percent decrease in the amount of radon-222 each day.b) Write an exponential decay function for the amount of a 500 mg sample of radon-222 remaining after *t* days.c) How much of the radon-222 sample would remain after 14 days? |   |
| 5. How can the function $f\left(x\right)=16^{\frac{x}{8}}$ be rewritten so that the exponential term has a base of 4? | 6. For the function $p\left(x\right)=2.89^{{x}/{2}}$, by what percentage does p(x) change as x increases from 0 to 1? Does this function model exponential growth or exponential decay? |