

Exponential Growth/Decay

Name: _____

1) A certain stock opens with a price of \$0.59. Over the first three days, the value of the stock increases on average by 50% per day. If this trend continues, how many days will it take for the stock to be worth \$6?

2) Sue has a lamp from her great-grandmother. She has it appraised and finds it is worth \$1000. She wants to sell it, but the appraiser tells her that the value is appreciating by 8% per year. In how many years will the value of the lamp be \$2000?

3) The population of a small town is 15,000. If the population is shrinking by 5% per year, how long will it take for the population to reach 9000 people?

4) Bill invests \$3000 in a bond fund with an interest rate of 9% per year. If Bill does not withdraw any of the money, how much will the bond be worth in 8 years?

5) Cars depreciate in value at a rate of approximately 15% per year. If you bought a car for \$15,000 in 2010, what is it worth in 2016?

6a) Tony purchased a rare guitar in 2000 for \$12,000. Experts estimate that its value will increase by 14% per year. When will the guitar be worth \$60,000?

6b) At the same time Tony bought the \$12,000 guitar, he also considered buying another rare guitar for \$15,000. Experts estimated that this guitar would appreciate at a rate of 9% per year. Determine after how many years the two guitars would be worth the same amount. What is the amount?

7) A student has a baseball card that is worth \$6.35. He looks up the appreciation rate and finds it to be 2.5% per year. He wants to find how much it will be worth after 3 years. He writes the function $f(t) = 6.35(3.5)^t$ and uses the graph of the function to find the value after 3 years to be about \$272.26. What did the student do wrong? What is the correct answer?

8) Starting with 25 members, a club doubled its membership every year. Write a function $f(n)$ that expresses the number of members in the club after n years. Then find the number of members after 6 years.

9) A bacteria culture starts with 150 bacteria. If the size of the culture triples every hour, determine how long it will take for there to be 14250 bacteria.