Name: _____ Date: _____ Period: _____

Chapter 13: Logarithms
Topic 6: Log Word Problems

Complete the examples below. All answers should be rounded to the nearest tenth of a year unless otherwise noted.

1.) An investment of $2000 receives 5% interest annually. After how many years has the investment increased to at least $2500?

2.) After how many years will an investment of $100 compounded quarterly at 6% interest be worth at least $450?

3.) After how many years will $100 invested at an annual rate of 6% compounded continuously be worth at least $450?

4.) Peter invests $500 into an account with 5% interest compounded monthly. After how many years will the account be worth at least $1200?

5.) The population of a small town is *decreasing* at the rate of 5% per year. The town historian records the population at the end of each year. In 2000 (n = 0), the population was 5,500. If this decrease continued, during what year will the population reach 4,000 people?

6.) Stanton wins $600 in the lottery. He chooses to invest his winnings into an account with 3.2% interest compounded continuously. After how many years will his investment triple?

8.) When Nico was born his parents invested $2,000 in a fund that paid an annual interest of 6%. How old will Nico be when the investment is worth at least $5000?

9.) The population of a small town is *decreasing* at the rate of 2% per year. The town historian records the population at the end of each year. In 2000 (n = 0), the population was 5,300. If this decrease continued, during what year will the population reach 4,200 people?

10.) Dion wins $500 in a soccer tournament. He decides to invest the money into an account with 6.8% interest compounded continuously. After how many years will his account reach $1200?

11.) The element fermium has a decay constant of -0.00866 days. After how many days will 7.0 grams remain of a 10-gram sample? Use the exponential decay model $A_n = A_0e^{-0.00866t}$ to solve.

12.) When Heather was 5 her grandparents gave her $5000 for her college education. Heather's parents invested that money into a college savings account earning 12% interest compounded monthly. How old will Heather be when her account reaches $20,000?

13.) An investment of $5,200 receives 4% interest annually. After how many years has the investment increased to at least $10,000?

14.) Enrollment at a particular college is decreasing at a constant rate of 3% each year. In 2010 (n = 0) enrollment is at 50,000, during what year will enrollment reach 35,000 students?

15.) If a $200 investment receives 7.5% interest each year, after how many years will the investment have doubled in value?

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Answer Key:

1.) 4.6 years 2.) 25.3 years 3.) 25.1 years 4.) 17.5 years

5.) 2006 6.) 34.3 years 7.) 6 years 8.) 15.7 years

9.) 2011 10.) 12.9 years 11.) 41.2 days 12.) 16

13.) 16.7 years 14.) 2021 15.) 9.5 years