Name _____ Date _____
Mr. Schlansky Algebra II

Exponential Modeling Finding t

1. Megan opens a savings account with $5,000 in it. If interest is compounded weekly at a rate of 4.3%, write an equation for $b(t)$, the balance of her account after t years. Using your equation, how long will it take, to the *nearest tenth of a year*, for Megan's money to reach $8,000?

2. One of the medical uses of Iodine–131 (I–131), a radioactive isotope of iodine, is to enhance x-ray images. The half-life of I–131 is approximately 8.02 days. A patient is injected with 20 milligrams of I–131. Create an equation for $a(t)$, the amount of Iodine-131 remaining after t days. Determine, to the *nearest day*, the amount of time needed before the amount of I–131 in the patient's body is approximately 7 milligrams.

3. Tyler opens a bank account with $5,450 with an annual interest rate of 5.3% compounded continuously. Write an equation for $b(t)$, the balance of Tyler's account after t years. Using your equation, to the *nearest hundredth of a year*, how long will it take for Tyler's account to triple?

4. Jessica deposits $2000 into a bank account where 4% interest is given every 2.4 years. Write an equation for $v(t)$, the value of Jessica's account after *t* years. Using your equation, to the *nearest tenth of a year*, how long will it take for Jessica's investment to reach $5000?

5. Manny opens a savings account with $6,400.00 with a 5.2% interest rate that is compounded quarterly. Write an equation for $b(t)$, the balance of the account after *t* years. Using your equation, to the nearest *tenth of a year,* how long will it take for Manny's balance to double?

6. Christopher is preparing for the Nassau County Spelling Bee. Currently, Christopher knows 1200 words and will learn 20% more words every 4 days. Write an equation, $A(t)$, to represent how many words Christopher will be able to spell after *t* days. After how many days, to the *nearest day,* will Christopher be able to spell 5000 words?

7. If a bank account was opened with \$3000 and interest is compounded continuously at 5.2%. Write an equation for $v(t)$, the value of the account after t years. To the *nearest hundredth of a year*, how long will it take for the value of the account to reach \$4000?

8. Danielle bought a basketball card for \$2125 its value is increasing by 4.1% each year. Create an equation for $v(t)$, the value of the basketball card after t years. Using your equation, how long, to the *nearest year*, will it take for the value of the basketball card to reach \$10000?

9. Miguel opened a bank account with \$1000 and interest is compounded monthly at a rate of 8.1%. Write an equation to represent $b(t)$, the balance of Miguel's account after t years. Using your equation, how much time, to the *nearest year*, will it take for Miguel's money to triple?

10. Melanie bought a car for $52,000 and the car depreciates at a rate of 10% each year. Write an equation to represent the value of the car, $v(t)$, after t years. Using your equation, to the *nearest tenth of a year*, how long will it take until the value of her car reaches $22,000?

11. Jennifer initially invested $4800 in a bank account compounded continuously at a rate of 5.8%. Write an equation for $C(t)$, the value of her account after t years. After how much time, to the *nearest tenth of a year*, will it take for Jennifer's money to double?

12. The half-life of carbon-15 is 2.449 seconds. If Jackie has 17500 grams of carbon-15, write an equation for $j(t)$, the amount of grams of carbon-15 remaining after t seconds. After how much time will there be 500 grams of carbon-15 remaining? Round your answer to the *nearest tenth of a second*.