 Name: _____

6.5.D1 ~ Logarithms & Exponential Models

1. Let $B = 5000(1.06)^t$ give the balance of a bank account after t years. Calculate the **doubling time**.

2. The number of bacteria present in a culture after t hours is given by the function $N = 1000e^{0.68t}$, where the time t is measured in hours. What is the **doubling time**?

3. An investment is made in a trust fund at an annual interest rate of 8.75%, compounded continuously. How long will it take for the investment to **double**?

4. If the annual rate of inflation is 3%, how long will it take for prices to **double**?

5. In 2000, the population of Africa was 807 million and by 2011 it had grown to 1052 million.
   a. Use the change factor formula to calculate the value of b. *Round the value of b to 3 decimal places.*
   b. When will the population of Africa **double** its 2000 population?

6. The area of forest is reduced each year because of urban encroachment. If the rate of the area decreases at 2.6% each year, what is the **half-life** of the forest?

7. What is the **half-life** of a radioactive substance that decays at 10.4% per minute?

8. Suppose that a certain radioactive isotope has a continuous decay rate of 5%. What is the **half-life** of the element?

9. The **half-life** of nicotine in the body is 2 hours. Find the value of b. *Round the value of b to 4 decimal places.* What is the hourly decay rate?

10. The **half-life** of aspirin in your bloodstream is 12 hours. Find the value of b. *Round the value of b to 4 decimal places.* What is the hourly decay rate?