# *Pre-Test*

Name _____ Date _____

1. Vanessa deposits $12,000 in a savings account with an annual interest rate of 3.5%. What function represents the value of her account after *x* years? What will her balance be after 5 years?

2. Robert uses $f(x) = 1000(1.06)^x$ to calculate the interest he earns each year for his savings account. What is the monthly interest rate as a percent?

3. The population of Frillsville is changing exponentially. This change is modeled by the function $f(x) = 50{,}000(0.98)^x$. Interpret the function to describe how the population changes. Explain how you know.

4. Determine whether each function represents exponential growth or decay. Explain your reasoning.

   a. $f(x) = 2(5)^x$

   b. $g(x) = 6(1.05)^x$

   c. $h(x) = 3(1 - 0.03)^x - 5$

   d. $j(x) = 4\left(\frac{1}{4}\right)^x$

5. The population of bacteria in a petri dish is increasing exponentially. At noon, there were 32,600 bacteria in the dish. An hour later there were 34,556 bacteria. Write a function to model this situation. Determine the percent increase of the bacteria each hour.

6. Use the graph of $f(x) = 500(0.85)^x$ to help you find the value of x when $f(x) = 222$.
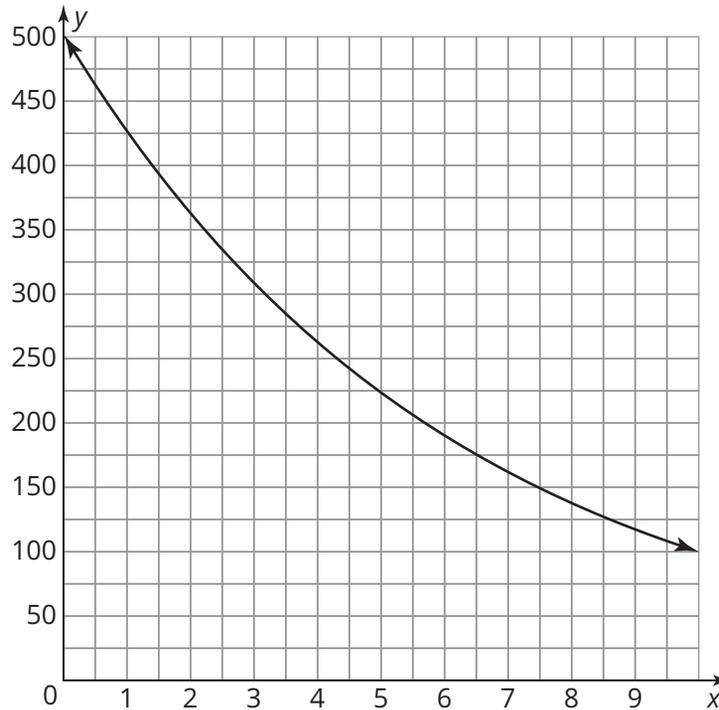
7. During a flood, there were 6000 acres of land under water. After 2 days, there were only 3375 acres of land under water. Assume that the water recedes at an exponential rate. Write a function to model this situation that has a *B*-value of 1.

8. The restaurants in a city were asked to reduce their use of sugar each year. The data on their usage is recorded in the table below.

Year	2013	2014	2015	2016	2017
Sugar (grams)	50,000,000	49,260,000	48,500,000	47,750,000	46,900,000

a. Determine the exponential regression equation that models the data.

b. Is the sugar usage modeled by exponential growth or exponential decay? Explain your reasoning.

c. According to the model, how much sugar will the restaurants use in 2020?