9-3 Notes Applications of Exponentials Name _____
NC Math 1

Exponential Growth _____ Exponential Decay _____

1. Since 1985, the daily cost of patient care in community hospitals in the United States has increased about 8.6% per year. In 1985, hospital costs were an average of $460 per day. The equation $y = 460(1.086)^x$ models the cost of hospital care. Use the equation to find the approximate cost per day in 1995.

2. Suppose your parents deposited $500 in an account paying 6.5% interest, compounded annually, when you were born. The equation $y = 500(1.065)^x$ is the equation which models the amount of savings. Use the equation to find the account balance after 18 years.

3. The function $y = 355(1.08)^x$ models the average annual cost y (in dollars) for tuition and fees at public two-year colleges. The variable x represents the number of years since 1980.

a. What was the average annual cost in 1980?

b. What is the average percent of increase in the annual cost?

c. Find the average annual cost for 1990.

d. Using the table function on your calculator, predict the average annual cost for the year you plan to graduate from high school.

4. In the United States for the period 1980-1998, the function $f(x) = 23.5(0.978735)^x$ describes the fatality rate (fatalities per 100,000) due to motor vehicle accidents. Assuming this model continued, determine the number of fatalities in the year 2000.

5. An investment of $1000 earns 3.75% interest compounded annually. Write the equation to describe this situation.

6. A new car, worth $20,000 loses 15% of its value each year. Write the equation to describe this situation and then determine how much is the car worth after 7 years.