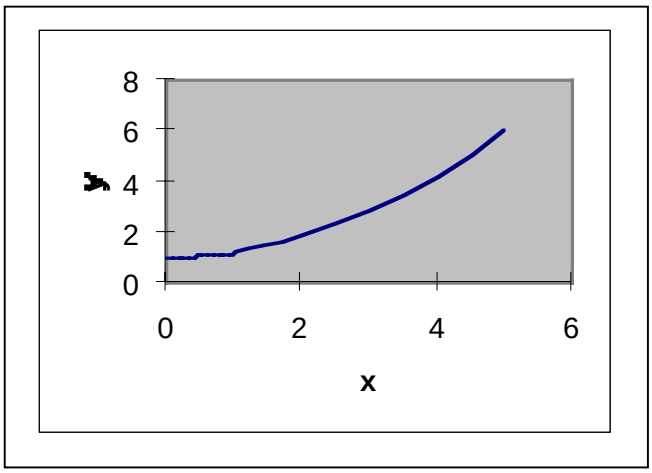
Homework Assignment 5: Due at the beginning of class 10/1/01

The graph and table shown in Figure 1 correspond to the **same** function. (Use this graph and table to answer Questions 1, 2 and 3.)



x	0	1	5
f(x)	1	1.2	6

Figure 1: Graph and table for Questions 1, 2 and 3.

1. Functions like the one shown above are often exponential functions: $y = A \cdot B^x$. Use the data in the table to decide whether this function is an exponential function or not.

2. Some functions with increasing, concave up graphs are power functions: $y = k \cdot x^p$ when the power p is greater than 1. Use the data in the table to decide whether this function is a power function or not.

3. One last possibility is that this function could be an exponential function or a power function that has been modified by adding 1 unit to the function, i.e.:

$$y = 1 + k \cdot x^p \qquad \text{OR} \qquad y = 1 + A \cdot B^x$$

Find an equation for this function that exactly matches the data given in the table. As part of your answer, you should show that your equation really does exactly match the values given in the table.

On a recent episode of the TV show NOVA ("Dying to be Thin," December 2000) the narrator described a study from the Mayo Clinic. According to this study, there are currently 8 million Americans who suffer from anorexia nervosa or bulimia nervosa. Furthermore, the study showed that the number of Americans suffering from these

diseases was increasing by 36% every five years. Problems 4 and 5 are based on the data reported in the Mayo Clinic study.

4. Is the number of Americans suffering from anorexia nervosa or bulimia nervosa a function of year? If so, what sort of function is it? Find an equation that predicts the number of Americans suffering from anorexia nervosa or bulimia nervosa each year.

5. What is the current population of the United States? (**IMPORTANT:** Cite your source along with the number.) Use the equation from Question 4 to predict the year when this many people in America will be suffering from anorexia nervosa or bulimia nervosa.