

### Homework Assignment 3: Due at the beginning of class 9/26/01

Table 1 gives the Kelley Blue Book™ value of different model years of Volkswagen Golf two door hatchbacks. Questions 1 and 2 use the data in Table 1.

Model Year	1985	1986	1987 <sup>1</sup>	1988	1989
Value of basic hatchback (\$)	2250	2550	No data	2950	3275

Table 1: Kelley Blue Book™ Value of Volkswagen hatchbacks, 1985-1989.

1. Plot a graph showing the value of a Volkswagen Golf hatchback versus model year.
2. Find the equation of a linear function that does a reasonable job of giving value as a function of year for Volkswagen hatchbacks. Draw the graph of your linear function using the same set of axes as Problem 1. Based on the information in this problem, what do you think the value of a 1987 basic Volkswagen golf would be if the basic hatchback had been manufactured in 1987?

Table 2 (below) shows the percentage of people in the US who lived in rural areas between 1830 and 1960<sup>2</sup>. Questions 3, 4 and 5 use the data contained in this table.

Year	1830	1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960
% rural	91.2	89.2	84.7	80.2	74.3	71.8	64.9	60.4	54.4	48.8	43.9	43.5	36.0	30.1

Table 2: Percentage of US population living in rural areas 1830-1960.

3. Plot a graph showing the percentage of people living in rural areas versus year. What features would a function (increasing/decreasing, concave up/down or no concavity) need to show in order to do a reasonable job of representing the trend(s) in your plot?
4. Find an equation that you can use to predict the percentage of people living in rural areas, given the year. Over what period(s) of time do you expect the predictions of your function to closely match the actual values of the data from Table 2?
5. Use your equation to predict the percentage if people living in rural areas in 2050. Does your answer make sense? Explain why or why not. (Hint: What is a reasonable "problem domain" for the equation you found in Question 4?)

<sup>1</sup> During the 1987 model year, Volkswagen did not manufacture a basic hatchback, only the enhanced GL model hatchback.

<sup>2</sup> Source: US Bureau of the Census, *The Statistical History of the United States* (1976).