

## A Quadratic Model of Upstate Per Capita Income

Per capita income in the Upstate of South Carolina has risen at a near constant rate in recent times. An activity you may have worked earlier in this course asked you to describe per capita income as a function of time. But a linear model is not a perfect fit for the case of the two adjacent counties, Greenville and Spartanburg. Here again are the figures supplied by the chambers of commerce for Greenville and Spartanburg counties:

Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Grvl:	14271	15488	16647	17400	17900	18500	19655	20073	20784	21503	22239	22986
Sptb:	12887	13929	14863	12218	15447	15921	16887	18141	18832	19538	20260	20990

Using your calculator or a computer spread sheet, find the least squares **parabola** predicting per capita income for each of the two counties. Using a word processor, write a short report comparing projected growth of income for the counties. Be sure to comment on the accuracy of the data and include answers to the following questions:

1. Will there come a time in the near future when the incomes will be the same in the two counties? Explain your reasoning.
2. What does your model (set of linear functions) say the difference in income will be in the year 2005? Explain how you arrived at your answer. (Suggestion: Perhaps you can construct *one* function that describes the difference in incomes for the two counties.)
3. When does your model predict the difference in income will be \$4000? Show your calculations.
4. Do you think the quadratic model or a linear model best fits reality? Justify your choice by explaining your thinking.

***Do not limit your report to these questions alone.*** Your organization, insight and ability to express your findings will be important in determining your grade.