

Section 2.3 (cont.)

2) Let $Q(p)$ equal the number of *ropa vieja* dinners La Carreta serves in one week when the price of the dinner is p dollars. Interpret the following:

a) $Q(8) = 338$

b) $Q'(8) = -2$

c) $\frac{dQ}{dp} = 11$ when $p = 6.25$

3) $T(x)$ is the total number of municipal employees of a small town x years after the year 2000. Using the following information, sketch the graph of T .

◀ $T(0) = 30$

◀ Between 2000 and 2002, the number of municipal employees declined at an average rate of 6 employees per year.

◀ The projected number of employees for 2006 is 45

◀ It is not possible to draw a line tangent to the graph of T at $x = 4$

◀ The graph of T is always concave up.

Section 2.4

1) A model for the national unemployment rate in 1995 is given by $U(x) = .025x^2 - .481x + 7.854$ percent unemployment where $x=1$ is January 1995, $x=2$ is February 1995, etc.

a) Find the unemployment rate in November 1995.

b) Write a formula in terms of h for the unemployment rate a little after November 1995.

c) Write a simplified formula for the slope of the secant line connecting the points at November 1995 and a little after November 1995.

d) What is the limiting value for the slope formula as h approaches zero? Interpret your answer.

2 The table shows the annual net income (in millions of dollars) for NIKE, Inc., from 1987-1993. (Source: *Hoover's Company Profiles*, 1997)

Year	1987	1988	1989	1990	1991	1992	1993
Income (millions of \$)	36	102	167	243	287	329	365

a) Find a quadratic model for NIKE's net income as a function of the year. Round the coefficients of the equation to two decimal places.

b) Use the limit definition of the derivative to develop a formula for the derivative of the rounded model.

c) Use the derivative formula in part *b* to find the rate of change of the equation in part *a* for the year 1989.