

Section 3.5

1) The number of households in a certain community is given by $h(x) = 1.26x^2 + 7800$ households x years after 2001. The proportion (expressed as a decimal) of the households in this same community that have DVD recorders is given by $p(x) = \frac{.663}{1 + 378.1e^{-1.875x}}$ x years after 2001.

a) What does $C(x) = h(x) \cdot p(x)$ represent?

b) Find and interpret the following:

- (i) $h(3)$ and $h'(3)$
- (ii) $p(3)$ and $p'(3)$
- (iii) $C(3)$ and $C'(3)$

2) A Cadillac dealership collected the following data on the average price on all Devilles sold from 1998 through 2002

Year	1998	1999	2000	2001	2002
Price	37,782	38,331	38,904	39,440	39,954

a) Find a model for the data

b) The number of Devilles sold each year at the same dealership is given in the following table.

Year	1996	1997	1998	1999	2000	2001	2002
Cars	131	122	109	106	108	118	129

Align the data so that the input values correspond with those in the model for part *a* and find an appropriate model.

c) Find a model for the total revenue obtained from the sale of Devilles as a function of the year.

d) How rapidly was the revenue from the sale of Devilles increasing in 2001?

Section 4.1

1) The revenue of a tire manufacturer can be modeled by $S(x) = 22.982(1.137)^x$ thousand dollars x years after 1966.

a) How much did revenue change from 1980 to 1981?

b) Use a derivative to approximate the change in part *a*.

2) The amount in an investment after t years is given by $A(t) = 5000(1.057)^t$ dollars

a) Give the rate-of-change formula for the amount.

b) Find the rate of change of the amount after 8 years. Write a sentence interpreting the answer.

c) On the basis of your answer to part *b*, determine by approximately how much the investment will grow during the first half of the 9th year.