

Section 4.1 (cont.)

3) If $f(5) = 12$ and $f'(5) = -2$, estimate $f(5.1)$.

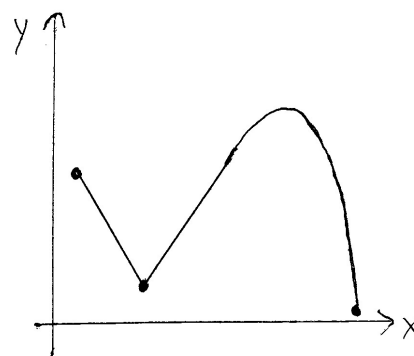
4) A printing company knows that the cost associated with various hourly production levels are as shown in the table.

Books printed each hour	100	200	300	400	500	600	700
Cost (in \$)	8700	9400	10,000	10,500	10,800	11,100	11,200

- Find a model for the data.
- Find and interpret marginal cost at a production level of 200 units.
- Find the cost to produce the 201st unit.
- Use the graph of the model to explain why the cost to produce the 201st unit is less than the marginal cost from part *b*.
- Find a model for average cost.
- Find and interpret the rate of change of average cost at a production level of 200 units.

Section 4.2

1) Mark the location of all relative maxima and minima with an X and all absolute maxima and minima with an O. For each extreme value that is not an endpoint, indicate whether the derivative at that point is zero or does not exist.



2) The average price (in dollars per 1000 cubic feet) of natural gas for residential use in the United States from 1980 through 1997 is given in the table.

(Source: *Statistical Abstract*, 1992 and 1998)

Year	1980	1982	1985	1990	1995	1996	1997
Price	3.68	5.17	6.12	5.77	6.06	6.34	6.93

- Find a model for the data.
- Use the model to find the absolute maximum and the absolute minimum average prices between 1984 and 1994. Give the years and the corresponding prices.
- If we had used the table values to answer part *b* we would have said the maximum value between 1984 and 1994 occurred in 1985 when the price was \$6.12 per 1000 cubic feet. Compare this answer to the maximum obtained from the model. Which do you believe is more accurate?