# Chapter 10 – 4b The Derivative

**Example 3.** The ozone level (in parts per billion) on a summer day in a metropolitan area is given by

,

where t is time in hours and t = 0 corresponds to 9 AM.

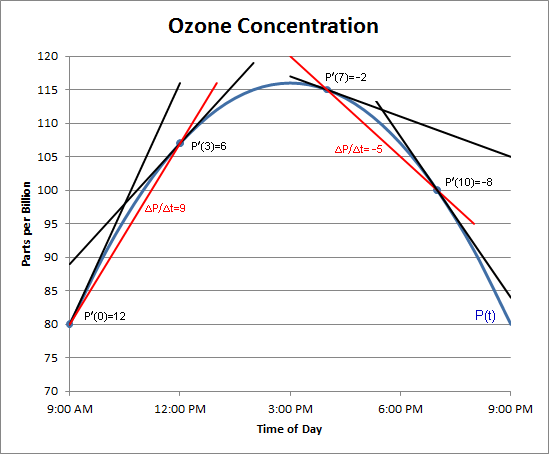
B) Find the change in the ozone level from 9 AM to noon. Find the average rate of change over this same time interval. Find the instantaneous rate of change at 9 AM and at noon.

parts per billion

At 9 AM, and at noon, .

C) Find the change in the ozone level from 4 PM to 7 PM. Find the average rate of change over this same time interval. Find the instantaneous rate of change at 4 PM and at 7PM.

ppb



At 4 PM,

At 7 PM,

**Example 4** The total sales of a company (in millions of dollars) from now until t months from now is estimated to be

,

Find S(15) and S’(15). Use S’(15) to estimate S(16) and S(17). Compare these estimates to the values given by the function.

