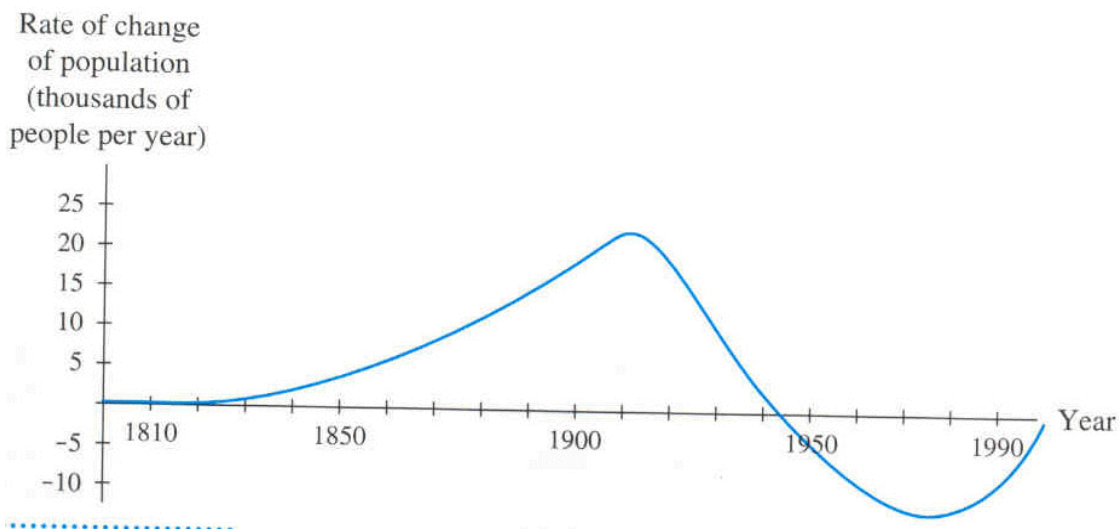


### Section 5.1 (cont.)

8) The graph below shows the rate of change of the population of Cleveland, Ohio as a function of the year. (Source: U.S. Bureau of the Census) Assume the x-intercept of the graph is 1942. Fill in the blanks in the following discussion of population. If it is not possible to determine a value, write NA in the corresponding blank.



The population of Cleveland increased between the years \_\_\_\_\_ and \_\_\_\_\_. The population in 1850 was \_\_\_\_\_ thousand people. The population is higher than nearby populations in the year \_\_\_\_\_. The population is decreasing most rapidly in the year \_\_\_\_\_. The area between the rate-of-change-of-population function and the horizontal axis between 1900 and 1950 has units \_\_\_\_\_.

If  $p'(t)$  represents the rate of change of population (in thousands of people per year) in year  $t$ , would  $\int_{1930}^{1940} p'(t) dt$  be more than, less than, or the same value as

$$\int_{1950}^{1990} p'(t) dt ? \underline{\hspace{2cm}}$$

9) The amount of money invested in a mutual fund is growing at a rate of  $a(x) = 840(1.088)^x$  dollars per year  $x$  years after it was invested.

a) Use the idea of a limit of sums to estimate the change in the amount in the mutual fund from the initial investment to 5 years after the initial investment.

b) Write the definite integral symbol for this limit of sums.

c) If the original investment totaled \$10,000, how much was in the mutual fund 5 years later?