

The rate of consumption of cola in the United States is given by $S(t) = Ce^{kt}$, where S is measured in billions of gallons per year and t is measured in years from the beginning of 1980.

- a) The consumption rate doubles every 5 years and the consumption rate at the beginning of 1980 was 6 billion gallons per year. Find C and k .
- b) Find the average rate of consumption of cola over the 10-year time period beginning January 1, 1983. Indicate units of measure.
- c) Use the trapezoidal rule with four equal subdivisions to estimate $\int_5^7 S(t)dt$.
- d) Using correct units, explain the meaning of $\int_5^7 S(t)dt$ in terms of cola consumption.

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