

Water is flowing into a reservoir at the rate of 5000 gallons per hour. There are 250,000 gallons at midnight of a given day and the rate of use by a neighboring town is given by the function:

$$R(t) = \frac{181,159}{1000t^2 - 26000t + 181,070} \text{ thousand gallons per hour,}$$

where t represents the number of hours since midnight.

- a) What is the average rate of use of the town on this day? Show your work and indicate units of measure.
- b) Write a function that would yield the number of thousands of gallons in the reservoir at any given time t .
- c) At what time of day is the amount of water in the reservoir a minimum? Show the work that leads to your conclusion.
- d) Determine the number of gallons of water in the reservoir at the end of the day ($t = 24$).