

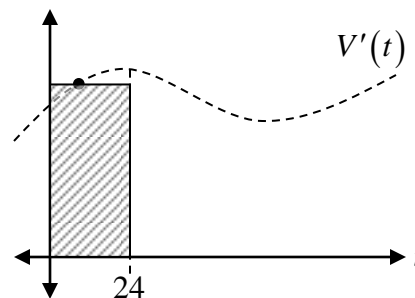
The Definite Integral as Net Change

Key idea: The net change is the definite integral of the rate of change.

Integral County needs to know about how much water is flowing into its reservoirs. One of Norm of Delta's many jobs is to check the gauging station on the River Calc once each day. The station tells the current rate of flow in thousands of cubic feet per hour. His weekly report shows the following.

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Time t_i	9:25 am	1:30 pm	8:00 am	11:30 am	8:30 am	10:20 am	11:30 am
Rate $V'(t_i)$ 1000 ft³ / hr	13	17	12	16	10	14	18

1. What is a reasonable estimate for the amount of water that flowed into the reservoir on Monday?



2. What is a reasonable estimate for the volume of water that flowed into the reservoir for the entire week? Write out, but do not evaluate, a Riemann Sum to determine this value. Label your value with proper units.

3. Write an expression involving an integral that will give the exact value of the volume of water that flowed into the reservoir for the entire week.

4. This reservoir does not have any water that flows out of it during this given week. Is it possible to determine the total volume of water in the reservoir at the end of the week? Why or why not?