

Example 1. The table below shows the rate of flow F of water out of a huge water tank, in in gallons per minute.

t	0	5	10	15	20	25	30
F	1000	633	414	264	155	69	0

- (a) What does $\int_0^{30} F(t) dt$ mean? What are its units?
- (b) Estimate $\int_0^{30} F(t) dt$.

Example 2. A certain population P of bacteria has growth rate given by the following formula:

$$\frac{dP}{dt} = \frac{1576e^{-0.7944t}}{(1 + 31e^{-0.7944t})^2} \quad (t = \text{days})$$

Set up an integral, and use your calculator to find the total change in bacteria from $t = 0$ to $t = 15$.