

# Definite Integrals

1. Find:

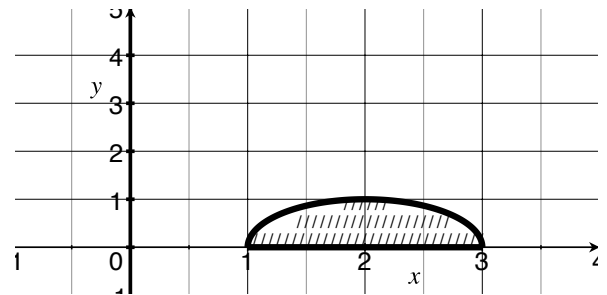
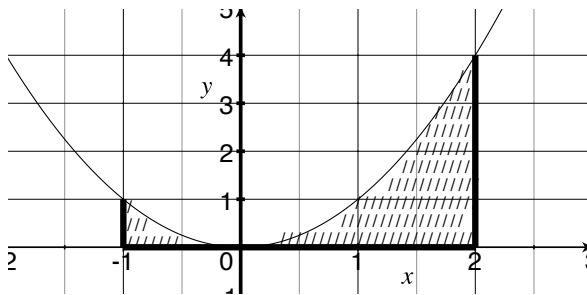
$$\int_0^3 x - 1 \, dx$$

$$\int_0^{2\pi} \sin(x) \, dx$$

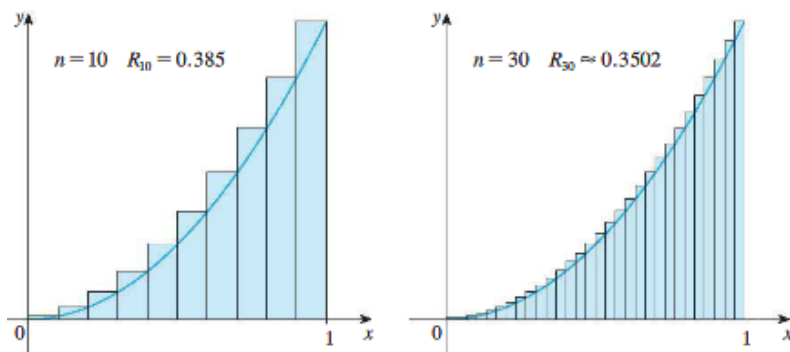
$$\int_1^1 x - 1 \, dx$$

$$\int_3^8 2 \, dx$$

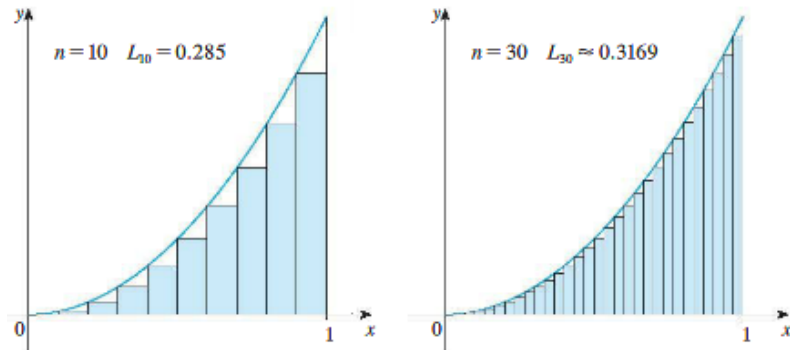
2. Describe each of the shaded areas below as a definite integral.



(source: Stewart's Calculus, Early Transcendentals §5.1)



**FIGURE 8** Right endpoints produce upper sums because  $f(x) = x^2$  is increasing



**FIGURE 9** Left endpoints produce lower sums because  $f(x) = x^2$  is increasing

3. The odometer on our car is broken but we would like to estimate the distance driven over a 30 second-time interval. We take the speedometer readings every five seconds, convert them into ft/s, and record them in the following table:

Time (s)	0	5	10	15	20	25	30
Velocity (ft/s)	25	31	35	43	47	46	41