5.2 The Definite Integral
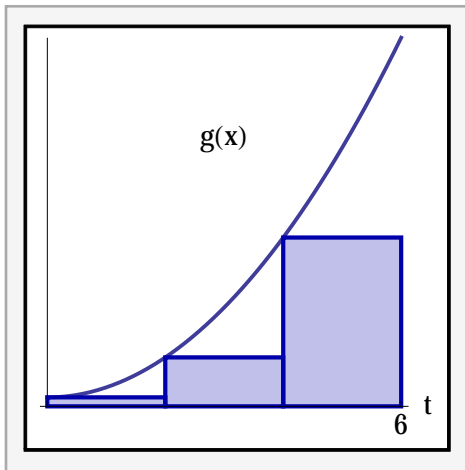
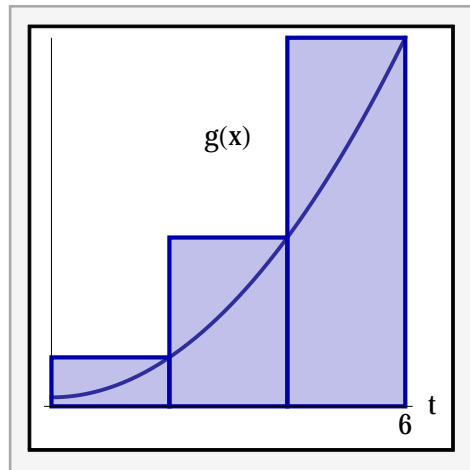Name: Date:

In Exercises 1-2, rectangles have been drawn to approximate $\int_0^6 g(x)\, dx$.

(a) Do the rectangles represent a left or right sum?

(b) Do the rectangles lead to an upper or a lower estimate?

(c) What is the value of n?

(d) What is the value of Δx?

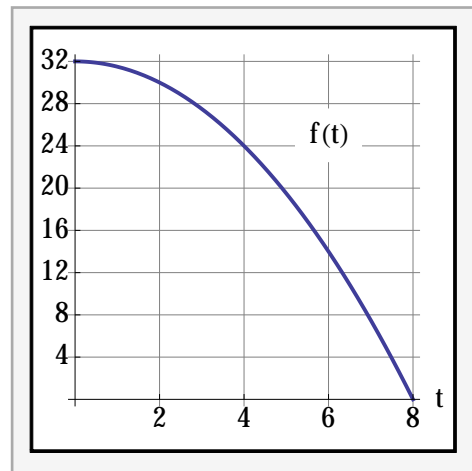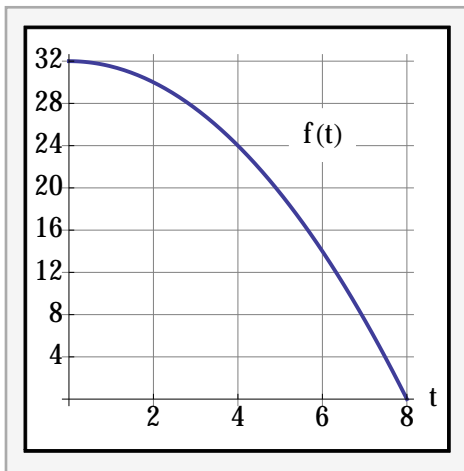**P 1.**   **P 2.**

P 4. Using the figure below, draw rectangles representing each of the following riemann sums for the function f on the interval $0 \le t \le 8$. Calculate the value of each of the sum.
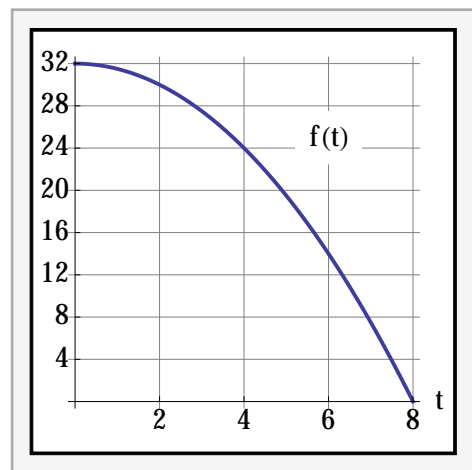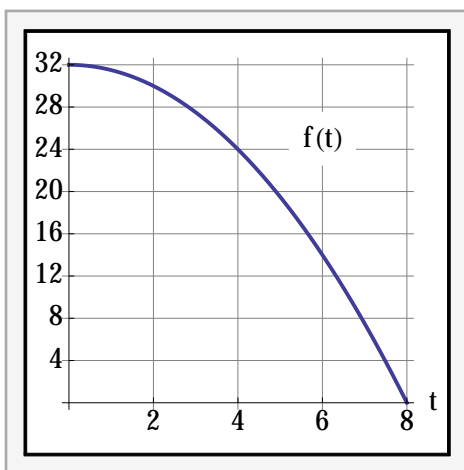
(a) Left-hand sum with $\Delta t = 4$.

(c) Left-hand sum with $\Delta t = 2$.

(d) Right-hand sum with $\Delta t = 2$.
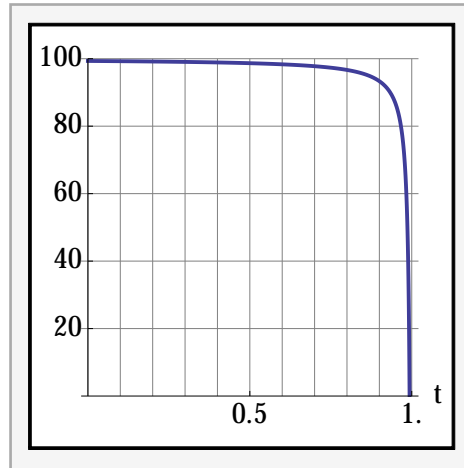
(b) Right-hand sum with $\Delta t = 4$.

P 18. The graph of $f(t)$ is in the figure below. Which of the following four numbers could be an estimate of $\int_0^1 f(t)\, dt$ accurate to two decimal places? Explain your choice.

I -98.35 II 71.84   III 100.12   IV 93.47

P 21.

(a) Find the total area between $f(x) = x^3 - x$ and the x-axis for $0 \leq x \leq 3$.

(b) Find $\displaystyle\int_0^3 f(x)\, dx$.

(c) Are the answers to part (a) and (b) the same? Explain.

P 31.

(a) Using the figure below, find $\int_{-3}^{0} f(x)\, dx$.

(b) If the area of the shaded region is A, estimate $\int_{-3}^{4} f(x)\, dx$.