

# Practice 11-6

## Area Under a Curve

Write and evaluate a sum to approximate the area under each curve for the domain  $0 \leq x \leq 2$ .

a. Use inscribed rectangles 0.5 unit wide.

b. Use circumscribed rectangles 0.5 unit wide.

1.  $y = -x^2 + 4$

2.  $f(x) = -2x^2 + 16$

3.  $g(x) = -0.5x^2 + 2$

4.  $f(x) = x^2 + 4$

5.  $y = 2x^2 + 6$

6.  $h(g) = 0.5x^2 + 2$

7.  $y = -3x^2 + 15$

8.  $f(x) = 3x^2 + 2$

9.  $f(x) = 10 - x^2$

10. a. Graph the curve  $y = 2x^2 + 1$ .

b. Use inscribed rectangles to approximate the area under the curve for the interval  $0 \leq x \leq 2$  and rectangle width of 0.5 unit.

c. Repeat part b using circumscribed rectangles.

d. Find the mean of the areas you found in parts b and c. Of the three estimates, which best approximates the area for the interval?

Use your graphing calculator to find the area under each curve for the domain  $-2 \leq x \leq 1$ .

11.  $y = -x^3 + 1$

12.  $f(x) = -2x^3 + 3$

13.  $f(x) = 2x^2 + 1$

14.  $g(x) = 3x^2 + 1$

15.  $y = -\frac{1}{4}x^2 + 1$

16.  $f(x) = 4x^2 + 2$

17.  $y = -x^2 + 4$

18.  $f(x) = x^2 + 1$

19.  $y = \sqrt{x + 3}$

Given each set of axes, what does the area under the curve represent?

20.  $y$ -axis: feet per second,  $x$ -axis: seconds

21.  $y$ -axis: computers produced per day,  $x$ -axis: days

22.  $y$ -axis: miles per hour,  $x$ -axis: hours

23.  $y$ -axis: gallons per minute,  $x$ -axis: minutes

24.  $y$ -axis: molecules per second,  $x$ -axis: seconds

25.  $y$ -axis: price per pound of apples,  $x$ -axis: pounds of apples

Graph each curve. Use inscribed rectangles to approximate the area under the curve for the interval and rectangle width given.

26.  $y = \frac{1}{4}x^2, 2 \leq x \leq 4, 1$

27.  $y = x^3 + 1, 0 \leq x \leq 2, 0.5$

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