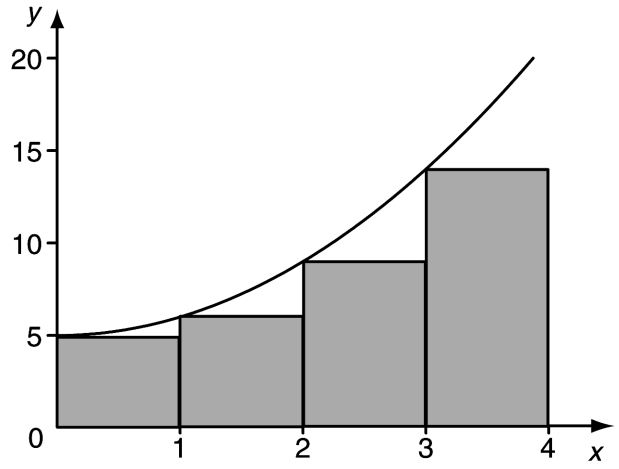
Chapter 4, Form A

1. Approximate $\int_0^4 (x^2+5)\,dx$ by computing the area of each rectangle and adding.

1. _____



Evaluate.

2. $\int \sqrt{6x}\,dx$

2. _____

3. $\int 500x^4\,dx$

3. _____

4. $\int \left(3e^x + \frac{1}{x} + x^{3/2}\right) dx$

4. _____

Find the area under the curve over the indicated interval.

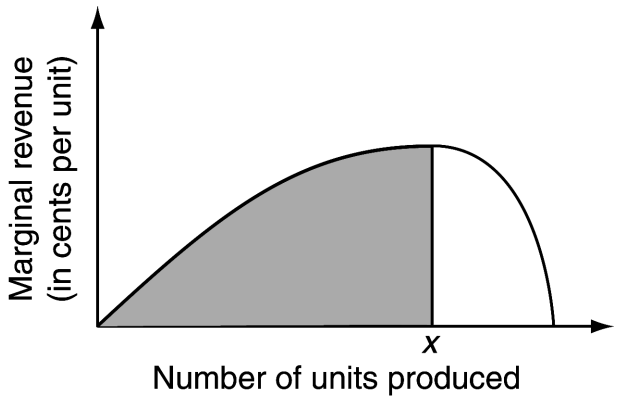
5. $y = 6x - x^2 - 8;\ [2, 4]$

5. _____

6. $y = \frac{6}{x};\ [1, 5]$

6. _____

7. Give an interpretation of the shaded area. **7.** _____



Evaluate.

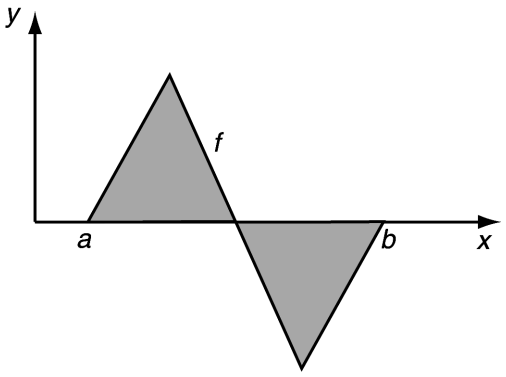
8. $\int_{-3}^{2}(4x+6x^5)\,dx$ **8.** _____

9. $\int_{0}^{3}e^{-7x}dx$ **9.** _____

10. $\int_{0}^{a}\sqrt{x}\,dx$ (assume $a>0$) **10.** _____

11. $\int_{0}^{4}g(x)\,dx$ where $g(x)=\begin{cases}3-x, & \text{for } x\le 3\\ x^2, & \text{for } x>3\end{cases}$ **11.** _____

12. Decide whether $\int_{a}^{b}f(x)\,dx$ is positive, negative, or zero. **12.** _____



Evaluate using substitution. Assume $u > 0$ when $\ln u$ appears. Do not use Table 1.

13. $\int \frac{dx}{x-4}$ **13.** _____

14. $\int e^{-0.9x}\,dx$ **14.** _____

15. $\int t(t^2-5)^7\,dt$ **15.** _____

Evaluate using integration by parts. Do not use Table 1.

16. $\int xe^{4x}\,dx$ **16.** _____

17. $\int x^6 \ln x^7 dx$ **17.** _____

Evaluate using Table 1.

18. $\int 4^x dx$ **18.** _____

19. $\int \frac{dx}{x(5-x)}$ **19.** _____

20. Find the average value of $y = 3t^5 + 2t$ over $[-2, 3]$. **20.** _____

21. Find the area of the region in the third quadrant bounded by $y = x$, and $y = x^3$. **21.** _____

22. *Business: cost from marginal cost.* An accessories company determines that the marginal cost, in dollars, of the xth purse is given by **22.** _____

$$C'(x) = -0.003x + 50,\ C(0) = \$0.$$

Find the total cost of producing 200 purses.

23. *Social Science: transcriptionist speed.* A transcriptionist's speed over a 5-min interval is given by **23.** _____

$$W(t) = -3t^2 + 14t + 50, t \text{ in } [0, 5];$$

where $w(t)$ is the speed, in words per minute, at time t. How many words are transcribed during the third minute (from $t = 2$ to $t = 3$)?

24. A robot leaving a spacecraft has velocity given by $v(t) = -0.6t^2 + 4t$, where $v(t)$ is in kilometers per hour and t is the number of hours since the robot left the space craft. Find the total distance traveled during the first 2 hr. **24.** _____

Integrate using any method. Assume $u > 0$ when $\ln u$ appears.

25. $\int \frac{10}{2 + 5x}\,dx$ **25.** _____

26. $\int x^4 e^x\,dx$ **26.** _____

27. $\int x^8 e^{x^9}\,dx$ **27.** _____

28. $\int \frac{1}{\sqrt{x}} \ln x\,dx$ **28.** _____

29. $\int \frac{dx}{49 - x^2}$ **29.** _____

30. $\int x^3 e^{-0.4x} dx$ **30.** _____

31. $\int x \ln(3x)\,dx$ **31.** _____

Evaluate using any method.

32. $\int x^3 \sqrt{x^2 - 5}\,dx$ **32.** _____

33. $\int \frac{[3 - 2(\ln x)^2 + 4(\ln x)^3]}{x} dx$ **33.** _____

34. $\int \ln\left(\frac{x+9}{x+2}\right) dx$ **34.** _____

35. Evaluate $\int 3^x dx$ without using Table 1 **35.** _____

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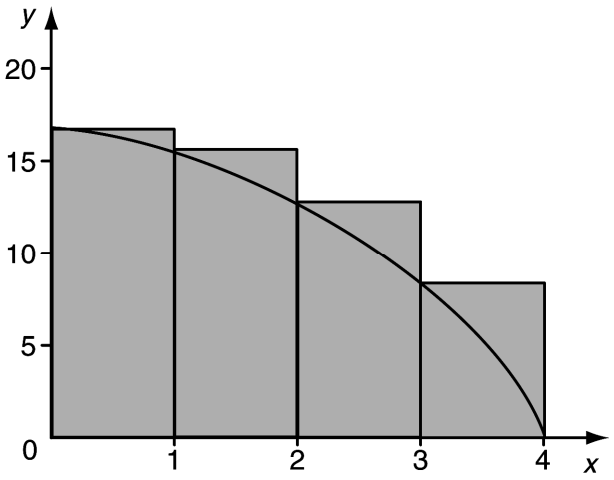
36. Use a calculator to approximate the area between the following curves: **36.** _____

$$y = 4x - x^3,$$
$$y = x^3 + x^2 - 4x.$$

1. Approximate $\int_0^4 (16 - x^2)\,dx$ by computing the area of each rectangle and adding. **1.** _____



Evaluate.

2. $\int \sqrt{11x}\,dx$ **2.** _____

3. $\int 148x^3\,dx$ **3.** _____

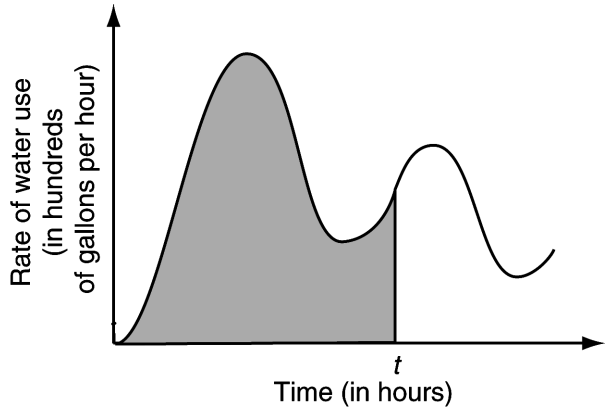
4. $\int \left(e^x + \frac{3}{x} + x^{3/4}\right) dx$ **4.** _____

Find the area under the curve over the indicated interval.

5. $y = 5x - x^2 - 4; [1, 4]$ **5.** _____

6. $y = \frac{2}{x}; [1, 10]$ **6.** _____

7. Give an interpretation of the shaded area. **7.**_____



Evaluate.

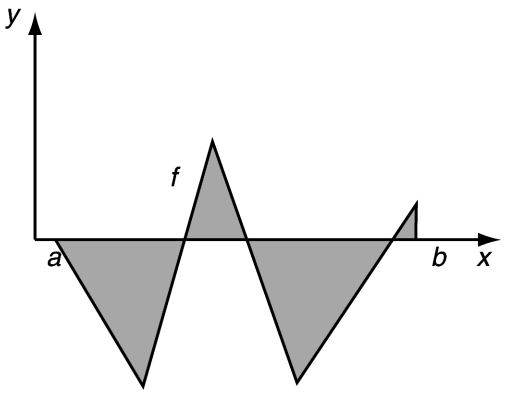
8. $\int_{-1}^{2}(5x+4x^3)\,dx$ **8.** _____

9. $\int_{0}^{5}e^{-3x}dx$ **9.** _____

10. $\int_{1}^{a^2}\frac{dx}{x^2}$ **10.** _____

11. $\int_{0}^{5}g(x)\,dx$ where $g(x)=\begin{cases}2-x, & \text{for } x\le 1\\ 3x^2, & \text{for } x>1\end{cases}$ **11.** _____

12. Decide whether $\int_{a}^{b}f(x)\,dx$ is positive, negative, or zero. **12.** _____



Evaluate using substitution. Assume $u > 0$ when $\ln u$ appears. Do not use Table 1.

13. $\int \frac{dx}{x+3}$ **13.** _____

14. $\int e^{-0.125x}\,dx$ **14.** _____

15. $\int t^3\sqrt{t^4+3}\,dt$ **15.** _____

Evaluate using integration by parts. Do not use Table 1.

16. $\int xe^{7x}dx$ **16.** _____

17. $\int x^4 \ln x^5\,dx$ **17.** _____

Evaluate using Table 1.

18. $\int 6^x dx$ **18.** _____

19. $\int \frac{dx}{x(3+x)}$ **19.** _____

20. Find the average value of $y = 2t - 6t^2$ over $[-5, 4]$. **20.** _____

21. Find the area of the region in the second quadrant bounded by $y = -x$, and $y = x^4$. **21.** _____

22. *Business: cost from marginal cost*. A gourmet popcorn company determines that the marginal cost, in dollars, of the xth bag of gourmet popcorn is given by **22.** _____

$$C'(x) = -0.0004x + 2.25, C(0) = \$0.$$

Find the total cost of producing 1000 bags of popcorn.

23. *Social Science: learning curve*. A translator's speed over 4-min interval is given by **23.** _____

$$w(t) = -6t^2 + 10t + 70, t \text{ in } [0, 4],$$

where $w(t)$ is the speed, in words per minute, at time t. How many words are translated during the second minute (from $t = 1$ to $t = 2$)?

24. A particle has starting velocity given by $v(t) = 3t^2 - 5t$, where $v(t)$ is in meters per second and t is the number of seconds since the particle left the starting point. Find the total distance traveled during the first 6 sec. **24.** _____

Integrate using any method. Assume $u > 0$ when $\ln u$ appears.

25. $\int \frac{6}{2+3x}\,dx$ **25.** _____

26. $\int 5x^4 e^x\,dx$ **26.** _____

27. $\int x^6 e^{x^7}\,dx$ **27.** _____

28. $\int \sqrt[3]{x}\ln x\,dx$ **28.** _____

29. $\int \frac{dx}{81-x^2}$ **29.** _____

30. $\int x^3 e^{-0.3x}\,dx$ **30.** _____

31. $\int x\ln(5x)\,dx$ **31.** _____

Evaluate using any method.

32. $\int x^3\sqrt{x^2+7}\,dx$ **32.** _____

33. $\int \frac{[8(\ln x)^3 - 2(\ln x)^2 - 6]}{x}dx$ **33.** _____

34. $\int \ln\left(\frac{x+4}{x-3}\right)dx$ **34.** _____

35. Evaluate $\int 7^x dx$ without using Table 1. **35.** _____

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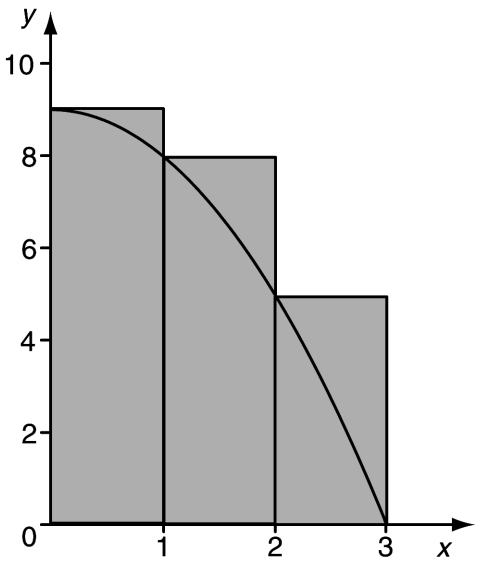
36. Use a calculator to approximate the area between the following curves: **36.** _____

$$y = 4x - 2x^2 + 4,$$
$$y = 4x^3 - 6x^2 + x + 4.$$

1. Approximate $\int_0^3 (9 - x^2)\,dx$ by computing the area of each rectangle and adding. **1.** _____



Evaluate.

2. $\int \sqrt{10x}\,dx$ **2.** _____

3. $\int 750x^5\,dx$ **3.** _____

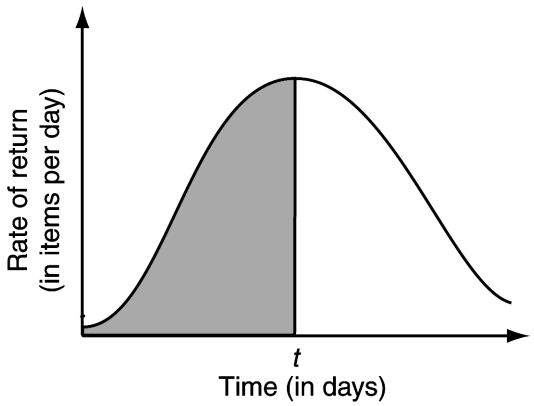
4. $\int \left(e^x + \frac{3}{x} + x^{3/5}\right)dx$ **4.** _____

Find the area under the curve over the indicated interval.

5. $y = 7x - x^2 - 10;\ [2, 5]$ **5.** _____

6. $y = \frac{5}{x}; [1, 7]$ **6.** _____

7. Give an interpretation of the shaded area. **7.** _____



Evaluate.

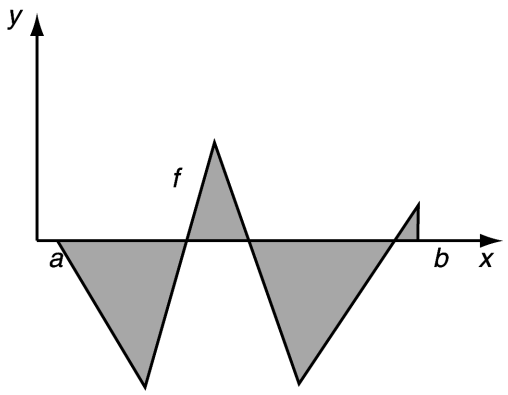
8. $\int_{-2}^{3}(4x^3+10x)\,dx$ **8.** _____

9. $\int_{0}^{9}e^{-4x}\,dx$ **9.** _____

10. $\int_{-a}^{0}\sqrt[3]{x}\,dx$ (assume $a>0$) **10.** _____

11. $\int_{0}^{8}g(x)\,dx$, where $g(x)=\begin{cases} x^3, & \text{where } x\le 4 \\ 5+x, & \text{where } x>4 \end{cases}$ **11.** _____

12. Decide whether $\int_{a}^{b}f(x)\,dx$ is positive, negative, or zero. **12.** _____



Evaluate using substitution. Assume $u > 0$ when $\ln u$ appears. Do not use Table 1.

13. $\int \frac{dx}{x+8}$ **13.** _____

14. $\int e^{-0.6x}dx$ **14.** _____

15. $\int t^4(t^5+6)^3\,dt$ **15.** _____

Evaluate using integration by parts. Do not use Table 1.

16. $\int xe^{6x}dx$ **16.** _____

17. $\int x^2 \ln x^3 dx$ **17.** _____

Evaluate using Table 1.

18. $\int 8^x\,dx$ **18.** _____

19. $\int \frac{dx}{x(2-x)}$ **19.** _____

20. Find the average value of $y = -2t^2 + 3t$ over $[-3, 4]$. **20.** _____

21. Find the area of the region in the first quadrant bounded by $y = 4x$, and $y = x^3$. **21.** _____

22. *Business: cost from marginal cost.* An appliance company determines the marginal cost, in dollars, of the xth refrigerator is giving by **22.** _____

$$C'(x) = -0.5x + 750, C(0) = \$0$$

Find the total cost of producing 100 refrigerators.

23. *Social Science: transcriptionist speed.* A transcriptionist's speed over 6-min interval is given by **23.** _____

$$w(t) = -3t^2 + 12t + 40, t \text{ in } [0, 6]$$

where $w(t)$ is the speed, in words per minute, at time t. How many words are transcribed during the fifth minute (from $t = 4$ to $t = 5$)?

24. A robot leaving a spacecraft has velocity given by $v(t) = -0.3t^2 + 4t$, where $v(t)$ is in kilometers per hour and t is the number of hours since the robot left the spacecraft. Find the total distance traveled during the first 5 hr. **24.** _____

Integrate using any method. Assume $u > 0$ when $\ln u$ appears.

25. $\int \frac{5}{3+2x}\,dx$ **25.** _____

26. $\int x^3 e^x\,dx$ **26.** _____

27. $\int x^4 e^{x^5}\,dx$ **27.** _____

28. $\int \frac{1}{x}\ln x\,dx$ **28.** _____

29. $\int \frac{dx}{25-x^2}$ **29.** _____

30. $\int x^5 e^{-0.2x}dx$ **30.** _____

31. $\int x\ln(25x)\,dx$ **31.** _____

Evaluate using any method.

32. $\int x^3\sqrt{x^2-3}\,dx$ **32.** _____

33. $\int \frac{[3(\ln x)^2+5\ln x-2]}{x}dx$ **33.** _____

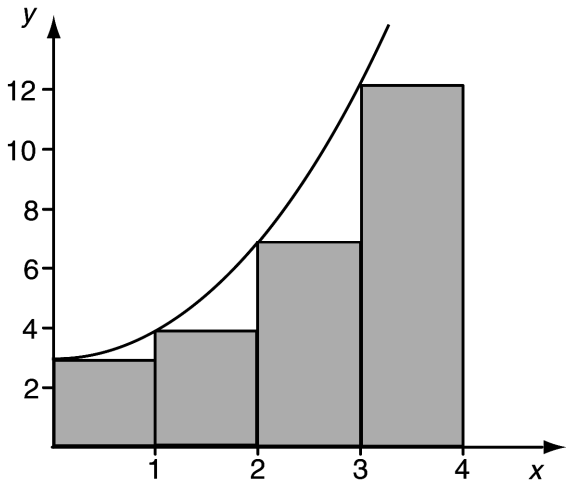
34. $\int \ln\left(\frac{x+8}{x-2}\right)dx$ **34.** _____

35. Evaluate $\int 6^x\,dx$ without using Table 1. **35.** _____

36. Use a calculator to approximate the area between the following curves: **36.** _____

$$y = 10x + x^2,$$
$$y = x^3 + x^2 + x.$$

1. Approximate $\int_0^4 (x^2+3)\,dx$ by computing the area of each rectangle and adding.



1. _____

Evaluate.

2. $\int \sqrt{2x}\,dx$ **2.** _____

3. $\int 300x^8\,dx$ **3.** _____

4. $\int \left(2e^x + \frac{1}{x} + x^{1/2}\right) dx$ **4.** _____

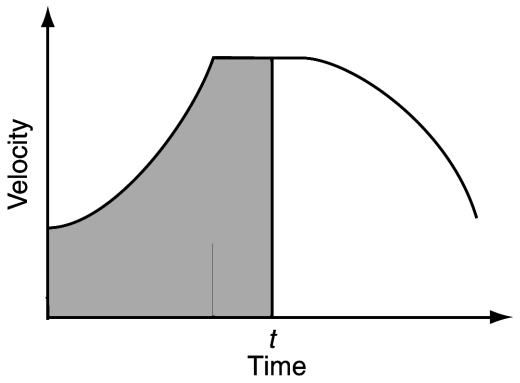
Find the area under the curve over the indicated interval.

5. $y = 5x - x^2 - 6; [2, 3]$ **5.** _____

6. $y = \frac{3}{x}; [1, 2]$ **6.** _____

7. Give an interpretation of the shaded area.

7. _____



Evaluate.

8. $\int_{-3}^{2}(2x+4x^3)\,dx$

8. _____

9. $\int_{0}^{6} e^{-8x}\,dx$

9. _____

10. $\int_{a}^{2a}\frac{dx}{x}$ (assume $a>0$)

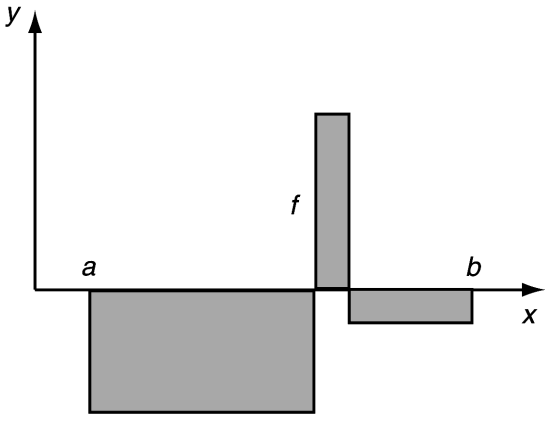
10. _____

11. $\int_{0}^{3} g(x)\,dx$, where $g(x)=\begin{cases}2x^2, & \text{where } x\le 2\\ 4-x & \text{where } x>2\end{cases}$

11. _____

12. Decide whether $\int_{a}^{b} f(x)\,dx$ is positive, negative, or zero.

12. _____



Evaluate using substitution. Assume $u > 0$ when $\ln u$ appears. Do not use Table 1.

13. $\int \frac{dx}{x+7}$ **13.** _____

14. $\int e^{-0.05x}\,dx$ **14.** _____

15. $\int t^5(4-t^6)^2\,dt$ **15.** _____

Evaluate using integration by parts. Do not use Table 1.

16. $\int xe^{3x}\,dx$ **16.** _____

17. $\int x^5 \ln x^6\,dx$ **17.** _____

Evaluate using Table 1.

18. $\int 3^x dx$ **18.** _____

19. $\int \frac{dx}{x(6+x)}$ **19.** _____

20. Find the average value of $y = 5t^4 + 2t$ over $[-3, 4]$. **20.** _____

21. Find the area of the region in the first quadrant bounded by $y = 2x$, and $y = x^2$. **21.** _____

22. *Business: cost from the marginal cost*. A clothing company determines that the marginal cost, in dollars, of the xth jacket is given by **22.** _____

$$C'(x) = -0.08x + 35, C(0) = \$0.$$

Find the total cost of producing 200 jackets.

23. *Social Science: learning curve*. A translator's speed over 5-min interval is given by **23.** _____

$$w(t) = -9t^2 + 16t + 25, \ t \text{ in } [0, 4]$$

where $w(t)$ is the speed, in words per minute, at time t. How many words are translated during the third minute (from $t = 2$ to $t = 3$)?

24. A particle hast starting velocity given by $v(t) = 5t^2 + t$, where $v(t)$ is in meters per second and t is the number of seconds since the particle left the starting point. Find the total distance traveled during the first 3 sec. **24.** _____

Integrate using any method. Assume $u > 0$ when $\ln u$ appears.

25. $\int \frac{3}{5+4x} dx$ **25.** _____

26. $\int 3x^5 e^x dx$ **26.** _____

27. $\int x^9 e^{x^{10}}\,dx$ **27.** _____

28. $\int \frac{1}{x^2}\ln x\,dx$ **28.** _____

29. $\int \frac{dx}{36-x^2}$ **29.** _____

30. $\int x^5 e^{-0.25x}\,dx$ **30.** _____

31. $\int x\ln(6x)\,dx$ **31.** _____

Evaluate using any method.

32. $\int x^3\sqrt{x^2+2}\,dx$ **32.** _____

33. $\int \frac{[3+2(\ln x)^2+(\ln x)^5]}{x}dx$ **33.** _____

34. $\int \ln\left[(x-5)(x+3)\right]dx$ **34.** _____

35. Evaluate $\int 2^x dx$ without using Table 1. **35.** _____

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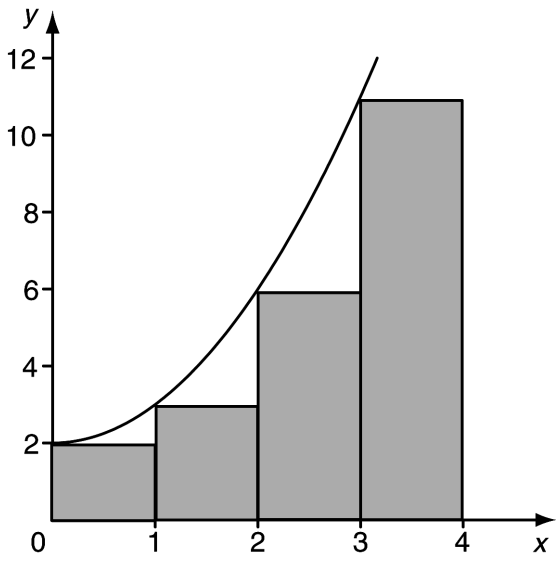
36. Use a calculator approximate the area between the following curves: **36.** _____

$$y = 3x - 2x^2 + 2,$$
$$y = 4x^3 - 2x^2 - x + 2.$$

1. Approximate $\int_0^4 (x^2+2)\,dx$ by computing the area of each rectangle and adding.

1. _____



Evaluate.

2. $\int \sqrt{7x}\,dx$

2. _____

3. $\int 210x^6 dx$

3. _____

4. $\int \left(e^x + \frac{4}{x} + x^{3/2}\right) dx$

4. _____

Find the area under the curve over the indicated interval.

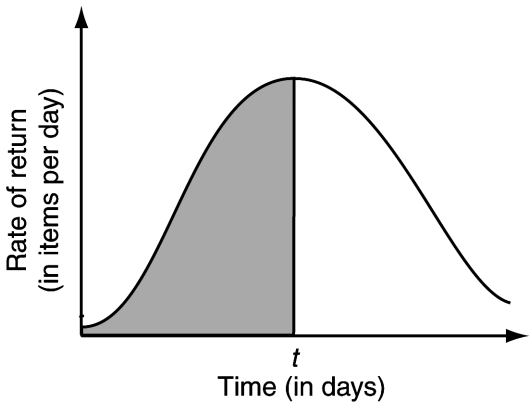
5. $y = 9x - x^2 - 18; [3, 6]$

5. _____

6. $y = \frac{7}{x}; [1, 9]$

6. _____

7. Give an interpretation of the shaded area. **7.** _____



Evaluate.

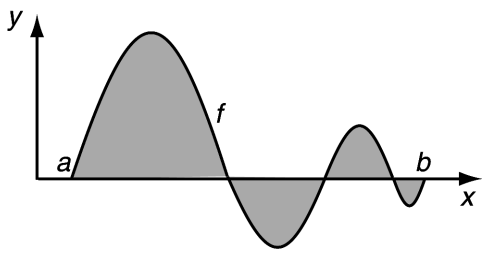
8. $\int_{-2}^{3}(6x^2+2x)\,dx$ **8.** _____

9. $\int_{0}^{2}e^{-10x}\,dx$ **9.** _____

10. $\int_{0}^{a}\sqrt{x}\,dx$ (assume $a>0$) **10.** _____

11. $\int_{0}^{5}g(x)dx$, where $g(x)=\begin{cases} x^2, & \text{where } x\le 3 \\ 4+x, & \text{where } x>3 \end{cases}$ **11.** _____

12. Decide whether $\int_{a}^{b}f(x)dx$ is positive, negative, or zero. **12.** _____



Evaluate using substitution. Assume $u > 0$ when $\ln u$ appears. Do not use Table 1.

13. $\int \frac{dx}{x-10}$ **13.** _____

14. $\int e^{-0.7x}dx$ **14.** _____

15. $\int t^4(t^5-2)^2\,dt$ **15.** _____

Evaluate using integration by parts. Do not use Table 1.

16. $\int xe^{2x}dx$ **16.** _____

17. $\int x^{10}\ln x^{11}dx$ **17.** _____

Evaluate using Table 1.

18. $\int 7^x dx$ **18.** _____

19. $\int \frac{dx}{x(4+x)}$ **19.** _____

20. Find the average value of $y = 4t^3 + 6t^2$ over $[-3, -1]$. **20.** _____

21. Find the area of the region in the second quadrant bounded by $y = -3x$, and $y = x^2$. **21.** _____

22. *Business: cost from the marginal cost*. An office equipment company determines that the marginal cost, in dollars of the xth file cabinet is given by **22.** _____

$$C'(x) = -0.16x + 50, C(0) = \$0.$$

Find the total cost of producing 150 file cabinets

23. *Social Science: transcriptionist speed*. A transcriptionist's speed over 4-min interval is given by **23.** _____

$$w(t) = -6t^2 + 8t + 45, t \text{ in } [0, 3]$$

where $w(t)$ is the speed, in words per minute, at time t. How many words are transcribed during the third minute (from $t = 2$ to $t = 3$) ?

24. A robot leaving a spacecraft has velocity given by $v(t) = -0.4t^2 + 3t$, where $v(t)$ is in kilometers per hour and t is the number of hours since the robot left the spacecraft. Find the total distance traveled during the first 3 hr. **24.** _____

Integrate using any method. Assume $u > 0$ when $\ln u$ appears.

25. $\int \frac{5}{1+4x}\,dx$ **25.** _____

26. $\int 3x^3 e^x\,dx$ **26.** _____

27. $\int x^2 e^{x^3}\,dx$ **27.** _____

28. $\int \frac{1}{\sqrt{x}} \ln x\,dx$ **28.** _____

29. $\int \frac{dx}{144 - x^2}$ **29.** _____

30. $\int x^4 e^{-0.2x}\,dx$ **30.** _____

31. $\int x \ln(12x)\,dx$ **31.** _____

Evaluate using any method.

32. $\int x^3 \sqrt{x^2 - 6}\,dx$ **32.** _____

33. $\int \frac{[10 + 5(\ln x)^5 - 2(\ln x)^{10}]}{x}$ **33.** _____

34. $\int \ln\left(\frac{x-5}{x+2}\right) dx$ **34.** _____

35. Evaluate $\int 8^x\,dx$ without using Table 1. **35.** _____

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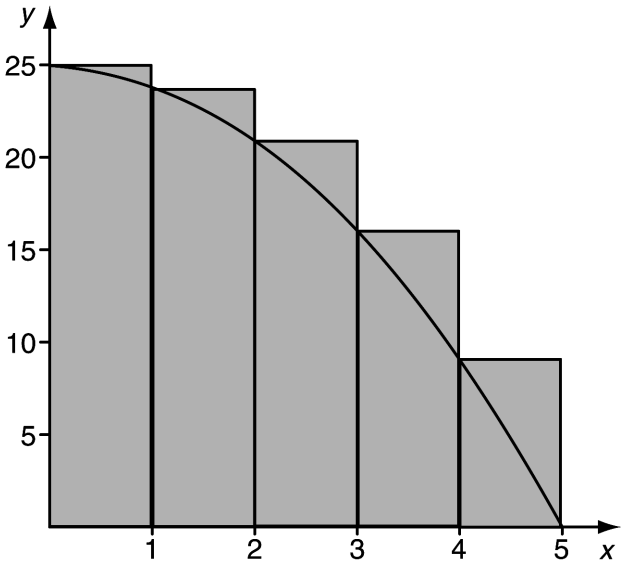
36. Use a calculator to approximate the area between the following curves: **36.** _____

$$y = 4x - x^2,$$
$$y = 3x^3 - x^2 - 8x.$$

1. Approximate $\int_0^5 (25 - x^2)\,dx$ by computing the area of each rectangle and adding.

1. _____



Evaluate.

2. $\int \sqrt{13x}\,dx$

2. _____

3. $\int 450x^4 dx$

3. _____

4. $\int \left(3e^x + \frac{5}{x} + x^{5/6}\right) dx$

4. _____

Find the area under the curve over the indicated interval.

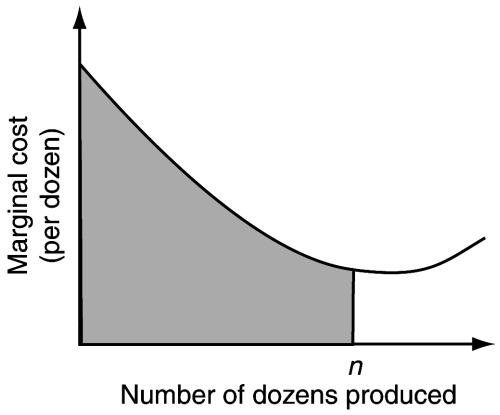
5. $y = 7x - x^2 - 6; [1, 6]$

5. _____

6. $y = \frac{8}{x}; [1, 6]$

6. _____

7. Give an interpretation of the shaded area. **7.** _____



Evaluate.

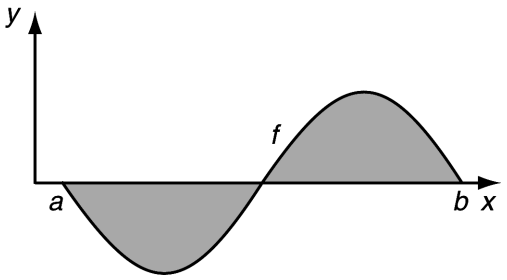
8. $\int_{-1}^{2}(2x+12x^5)\,dx$ **8.** _____

9. $\int_{0}^{12}-e^{9x}\,dx$ **9.** _____

10. $\int_{0}^{3a}\frac{3}{x}dx$ (assume $a>0$) **10.** _____

11. $\int_{0}^{7}g(x)\,dx$, where $g(x)=\begin{cases} x^3, & \text{where } x\le 2 \\ 1+x, & \text{where } x>2 \end{cases}$ **11.** _____

12. Decide whether $\int_{a}^{b}f(x)\,dx$ is positive, negative, or zero. **12.** _____



Evaluate using substitution. Assume $u > 0$ when $\ln u$ appears. Do not use Table 1.

13. $\int \frac{dx}{x+13}$ **13.** _____

14. $\int e^{-0.3x} dx$ **14.** _____

15. $\int t^4 \sqrt{t^5+5}\, dt$ **15.** _____

Evaluate using integration by parts. Do not use Table 1.

16. $\int x e^{8x} dx$ **16.** _____

17. $\int x^9 \ln x^{10} dx$ **17.** _____

Evaluate using Table 1.

18. $\int 9^x\, dx$ **18.** _____

19. $\int \frac{dx}{x(8-x)}$ **19.** _____

20. Find the average value of $y = -3t^2 + 5t$ over $[-2, 1]$. **20.** _____

21. Find the area of the region in the second quadrant bounded by $y = -4x$, and $y = x^2$. **21.** _____

22. *Business: cost from the marginal cost.* A furniture company determines that the marginal cost, in dollars, of the xth sofa is given by **22.** _____

$$C'(x) = -0.2x + 600, C(0) = \$0.$$

Find the total cost of producing 50 sofas.

23. *Social Science: learning curve.* A translator's speed over a 6-min interval is given by **23.** _____

$$w(t) = -3t^2 + 18t + 30, t \text{ in } [0, 6],$$

where $w(t)$ is the speed, in words per minute, at time t. How many words are translated during the fourth minute (from $t = 3$ to $t = 4$)?

24. A particle has starting velocity given by $v(t) = 2t^2 + 3t$, where $v(t)$ is in meters per second and t is the number of seconds since the particle left the starting point. Find the total distance traveled during the first 4 sec. **24.** _____

Integrate using any method. Assume $u > 0$ when $\ln u$ appears.

25. $\int \frac{8}{3+4x} dx$ **25.** _____

26. $\int 10x^4 e^x dx$ **26.** _____

27. $\int x^3 e^{x^4}\,dx$ **27.** _____

28. $\int \sqrt[4]{x}\ln x\,dx$ **28.** _____

29. $\int \frac{dx}{9-x^2}$ **29.** _____

30. $\int x^4 e^{-0.5x}\,dx$ **30.** _____

31. $\int x\ln(10x)\,dx$ **31.** _____

Evaluate using any method.

32. $\int x^3\sqrt{x^2+8}\,dx$ **32.** _____

33. $\int \frac{[(\ln x)^4 - 3(\ln x)^2 + 4]}{x}dx$ **33.** _____

34. $\int \ln[(x-1)(x+6)]\,dx$ **34.** _____

35. Evaluate $\int 4^x\,dx$ without using Table 1. **35.** _____

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36. Use a calculator to approximate the area between the following curves: **36.** _____

$$y = -x^2 - 2x,$$
$$y = -2x^3 - x^2 + 6x.$$