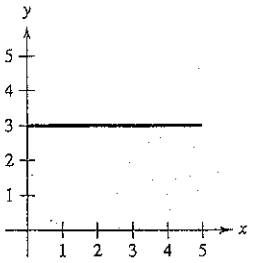
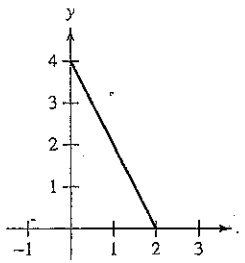
In Exercises 13–22, set up a definite integral that yields the ar of the region. (Do not evaluate the integral.)

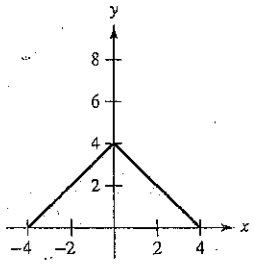
13. $f(x) = 3$



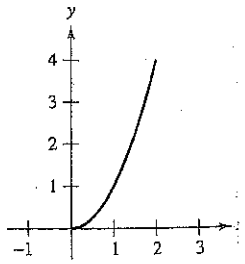
14. $f(x) = 4 - 2x$



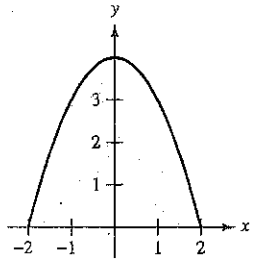
15. $f(x) = 4 - |x|$



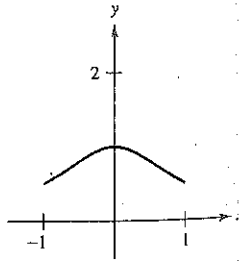
16. $f(x) = x^2$



17. $f(x) = 4 - x^2$



18. $f(x) = \dfrac{1}{x^2 + 1}$



41. Given $\int_0^5 f(x)\,dx = 10$ and $\int_5^7 f(x)\,dx = 3$, find

(a) $\int_0^7 f(x)\,dx$.

(b) $\int_5^0 f(x)\,dx$.

(c) $\int_5^5 f(x)\,dx$.

(d) $\int_0^5 3f(x)\,dx$.

45. ***Think About It*** The graph of f consists of line segments and a semicircle, as shown in the figure. Evaluate each definite integral by using geometric formulas.

(a) $\int_0^2 f(x)\,dx$

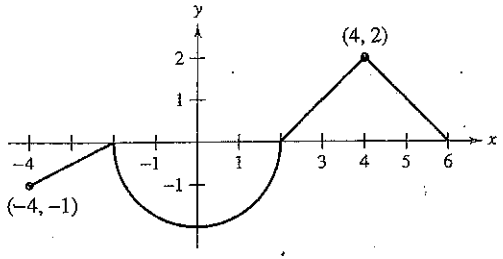
(b) $\int_2^6 f(x)\,dx$

(c) $\int_{-4}^2 f(x)\,dx$

(d) $\int_{-4}^6 f(x)\,dx$

(e) $\int_{-4}^6 |f(x)|\,dx$

(f) $\int_{-4}^6 [f(x) + 2]\,dx$



In Exercises 5–26, evaluate the definite integral of the algebraic function. Use a graphing utility to verify your result.

5. $\int_0^1 2x\,dx$

6. $\int_2^7 3\,dv$

7. $\int_{-1}^0 (x - 2)\,dx$

8. $\int_2^5 (-3v + 4)\,dv$

9. $\int_{-1}^1 (t^2 - 2)\,dt$

10. $\int_1^3 (3x^2 + 5x - 4)\,dx$

11. $\int_0^1 (2t - 1)^2\,dt$

12. $\int_{-1}^1 (t^3 - 9t)\,dt$

13. $\int_1^2 \left(\dfrac{3}{x^2} - 1\right)dx$

14. $\int_{-2}^{-1} \left(u - \dfrac{1}{u^2}\right)du$

15. $\int_1^4 \dfrac{u - 2}{\sqrt{u}}\,du$

16. $\int_{-3}^3 v^{1/3}\,dv$

17. $\int_{-1}^1 \left(\sqrt[3]{t} - 2\right)dt$

18. $\int_1^8 \sqrt{\dfrac{2}{x}}\,dx$

19. $\int_0^1 \dfrac{x - \sqrt{x}}{3}\,dx$

20. $\int_0^2 (2 - t)\sqrt{t}\,dt$

21. $\int_{-1}^0 \left(t^{1/3} - t^{2/3}\right)dt$

22. $\int_{-8}^{-1} \dfrac{x - x^2}{2\sqrt[3]{x}}\,dx$

23. $\int_0^3 |2x - 3|\,dx$

24. $\int_1^4 (3 - |x - 3|)\,dx$

25. $\int_0^3 |x^2 - 4|\,dx$

26. $\int_0^4 |x^2 - 4x + 3|\,dx$

In Exercises 27–32, evaluate the definite integral of the trigonometric function. Use a graphing utility to verify your result.

27. $\int_0^{\pi} (1 + \sin x)\,dx$

28. $\int_0^{\pi/4} \dfrac{1 - \sin^2\theta}{\cos^2\theta}\,d\theta$

29. $\int_{-\pi/6}^{\pi/6} \sec^2 x\,dx$

30. $\int_{\pi/4}^{\pi/2} (2 - \csc^2 x)\,dx$

31. $\int_{-\pi/3}^{\pi/3} 4 \sec\theta \tan\theta\,d\theta$

32. $\int_{-\pi/2}^{\pi/2} (2t + \cos t)\,dt$