1–28 ▪ Evaluate the integral.

1. $\displaystyle\int_{-1}^{3} x^5\,dx$

2. $\displaystyle\int_{1}^{3} (1 + 2x - 4x^3)\,dx$

3. $\displaystyle\int_{0}^{2} (6x^2 - 4x + 5)\,dx$

4. $\displaystyle\int_{-2}^{0} (u^5 - u^3 + u^2)\,du$

5. $\displaystyle\int_{0}^{1} x^{4/5}\,dx$

6. $\displaystyle\int_{1}^{8} \sqrt[3]{x}\,dx$

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

8. $\displaystyle\int_{\pi}^{2\pi} \cos\theta\,d\theta$

9. $\displaystyle\int_{-2}^{2} (3u + 1)^2\,du$

10. $\displaystyle\int_{0}^{4} (2v + 5)(3v - 1)\,dv$

11. $\displaystyle\int_{-2}^{-1} \left(4y^3 + \frac{2}{y^3}\right)\,dy$

12. $\displaystyle\int_{1}^{2} \frac{y + 5y^7}{y^3}\,dy$

13. $\displaystyle\int_{0}^{1} x\left(\sqrt[3]{x} + \sqrt[4]{x}\right)\,dx$

14. $\displaystyle\int_{1}^{9} \frac{3x - 2}{\sqrt{x}}\,dx$

15. $\displaystyle\int_{0}^{\pi/4} \sec^2 t\,dt$

16. $\displaystyle\int_{0}^{5} (2e^x + 4\cos x)\,dx$

17. $\displaystyle\int_{1}^{9} \frac{1}{2x}\,dx$

18. $\displaystyle\int_{0}^{1} 10^x\,dx$

19. $\displaystyle\int_{1/2}^{\sqrt{3}/2} \frac{6}{\sqrt{1 - t^2}}\,dt$

20. $\displaystyle\int_{0}^{1} \frac{4}{t^2 + 1}\,dt$

21. $\displaystyle\int_{1}^{64} \frac{1 + \sqrt[3]{x}}{\sqrt{x}}\,dx$

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

23. $\displaystyle\int_{-1}^{1} e^{u+1}\,du$

24. $\displaystyle\int_{0}^{1} (1 + x^2)^3\,dx$

33. Use a graph to estimate the x-intercepts of the curve $y = x + x^2 - x^4$. Then use this information to estimate the area of the region that lies under the curve and above the x-axis.

34. Repeat Exercise 33 for the curve $y = 2x + 3x^4 - 2x^6$.

35–36 ▪ Evaluate the integral and interpret it as a difference of areas. Illustrate with a sketch.

35. $\displaystyle\int_{-1}^{2} x^3\,dx$

36. $\displaystyle\int_{\pi/4}^{5\pi/2} \sin x\,dx$

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37–38 ▪ Verify by differentiation that the formula is correct.

37. $\displaystyle\int \frac{x}{\sqrt{x^2 + 1}}\,dx = \sqrt{x^2 + 1} + C$

38. $\displaystyle\int x\cos x\,dx = x\sin x + \cos x + C$

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39–40 ▪ Find the general indefinite integral. Illustrate by graphing several members of the family on the same screen.

39. $\displaystyle\int x\sqrt{x}\,dx$

40. $\displaystyle\int (\cos x - 2\sin x)\,dx$

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41–44 ▪ Find the general indefinite integral.

41. $\displaystyle\int (1 - t)(2 + t^2)\,dt$

42. $\displaystyle\int x(1 + 2x^4)\,dx$

43. $\displaystyle\int \frac{\sin x}{1 - \sin^2 x}\,dx$

44. $\displaystyle\int \frac{\sin 2x}{\sin x}\,dx$