

Review Exercises for Chapter 7

Evaluate the integrals in Exercises 1–46.

1. $\int (x + \sin x) dx$
2. $\int \left(x + \frac{1}{\sqrt{1-x^2}} \right) dx$
3. $\int (x^3 + \cos x) dx$
4. $\int (8t^4 - 5 \cos t) dt$
5. $\int \left(e^x - x^2 - \frac{1}{x} + \cos x \right) dx$
6. $\int \left(3^x - \frac{3}{x} + \cos x \right) dx$
7. $\int (e^\theta + \theta^2) d\theta$
8. $\int \frac{\sqrt[3]{x^2} - x^{5/2}}{\sqrt{x}} dx$
9. $\int x^2 \sin x^3 dx$
10. $\int \tan x \sec^2 x dx$
11. $\int x^2 e^{(x^3)} dx$
12. $\int x e^{(x^2)} dx$
13. $\int (x+2)^5 dx$
14. $\int \frac{dx}{3x+4}$
15. $\int x^2 e^{(4x^3)} dx$
16. $\int (1+3x^2) \exp(x+x^3) dx$
17. $\int 2 \cos^2 2x \sin 2x dx$
18. $\int 3 \sin 3x \cos 3x dx$
19. $\int x \tan^{-1} x dx$
20. $\int x \sqrt{5-x^2} dx$
21. $\int \left[\frac{1}{\sqrt{4-t^2}} + t^2 \right] dt$
22. $\int \frac{e^{2x}}{1+e^{4x}} dx$
23. $\int x e^{4x} dx$
24. $\int x e^{6x} dx$
25. $\int x^2 \cos x dx$
26. $\int x^2 e^{2x} dx$
27. $\int e^{-x} \cos x dx$
28. $\int e^{2x} \tan e^{2x} dx$
29. $\int x^2 \ln 3x dx$
30. $\int x^3 \ln x dx$
31. $\int x \sqrt{x+3} dx$

32. $\int x^2 \sqrt{x+1} dx$
33. $\int x \cos 3x dx$
34. $\int t \cos 2t dt$
35. $\int 3x \cos 2x dx$
36. $\int \sin 2x \cos x dx$
37. $\int x^3 e^{(x^3)} dx$
38. $\int x^5 e^{(x^3)} dx$
39. $\int x (\ln x)^2 dx$
40. $\int (\ln x)^2 dx$
41. $\int e^{\sqrt{x}} dx$
42. $\int \frac{dx}{x^2+2x+3}$ (Complete the square.)
43. $\int [\cos x] \ln(\sin x) dx$
44. $\int \frac{\ln \sqrt{x}}{\sqrt{x}} dx$
45. $\int \tan^{-1} x dx$
46. $\int \cos^{-1}(12x) dx$

Evaluate the definite integrals in Exercises 47–58.

47. $\int_{-1}^0 x e^{-x} dx$
48. $\int_1^e x \ln(5x) dx$
49. $\int_0^{\pi/5} x \sin 5x dx$
50. $\int_0^{\pi/4} x \cos 2x dx$
51. $\int_1^2 x^{-2} \cos(1/x) dx$
52. $\int_0^{\pi/2} x^2 \cos(x^3) \sin(x^3) dx$
53. $\int_0^{\pi/4} x \tan^{-1} x dx$
54. $\int_1^{\ln(\pi/4)} e^x \tan e^x dx$
55. $\int_{a+1}^{a+2} \frac{t}{\sqrt{t-a}} dt$ (substitute $x = \sqrt{t-a}$)
56. $\int_0^1 \frac{\sqrt{x}}{x+1} dx$
57. $\int_0^1 x \sqrt{2x+3} dx$
58. $\int_0^{\sqrt{3}} \frac{3}{3+u^2} du$

In Exercises 59–66, sketch the region under the graph of the given function on the given interval and find its area.

59. $40 - x^3$ on $[0, 3]$
60. $\sin x + 2x$ on $[0, 4\pi]$