

1. $\int \frac{(1 + \sqrt{x})^2}{\sqrt{x}} dx$
2. $\int \frac{x^2 + 2x + 2}{x + 2} dx$
3. $\int_1^{\sqrt{2/\ln 2}} \frac{e^{1/x^2}}{x^3} dx$
4. $\int (e^{2x} + 1)^2 dx$
5. $\int e^{2x} \sqrt{e^{2x} + 1} dx$
6. $\int e^x \sqrt{e^{2x} + 1} dx$
7. $\int \sqrt{e^{2x} + 1} dx$
8. $\int \frac{1}{\sqrt{x}(1 - \sqrt{x})} dx$
9. $\int x \sec^2(x^2) dx$
10. $\int x \sin x^2 \cos x^2 dx$
11. $\int x \sin 2x \cos 2x dx$
12. $\int \tan^5(2\theta/7) \sec^2(2\theta/7) d\theta$
13. $\int \frac{\tan^5(4\theta)}{\sec^5(4\theta)} d\theta$
14. $\int \frac{\tan^5(4\theta)}{\sec(4\theta)} d\theta$
15. $\int x \arctan x dx$
16. $\int \frac{1}{x\sqrt{x^2 - 5}} dx$
17. $\int \frac{x^2 + 5x + 2}{x^3 + x^2 + x + 1} dx$
18. $\int \frac{1}{x\sqrt{6x - x^2}} dx$
19. $\int \sin \theta \sin 2\theta d\theta$
20. $\int \frac{1}{x} \ln \left(\frac{e + 1}{x^2} \right) dx$
21. $\int_{1/2}^1 \frac{x - 3}{x^3 + x^2} dx$
22. $\int_0^1 \frac{\sqrt[3]{t}}{1 + \sqrt[3]{t}} dt$
23. $\int \frac{1}{x^2 \sqrt{1 - 4x^2}} dx$
24. $\int x \sqrt{1 - x^4} dx$
25. $\int \csc^3 \left(\frac{x}{3} \right) \cot^3 \left(\frac{x}{3} \right) dx$
26. $\int x^4 \ln x dx$
27. $\int_1^e x \ln^4 x dx$
28. $\int \frac{\sin^3 x - \tan^2 x}{\cos^2 x} dx$
29. $\int \frac{e^x}{e^x - 2 + e^{-x}} dx$
30. $\int \frac{x + 5}{x^2 + 2x + 5} dx$
31. $\int \frac{5x^2}{\sqrt{3 - 2x^2}} dx$
32. $\int \frac{\sin^2 \theta \tan \theta}{\sec^5 \theta} d\theta$
33. $\int 5y^3(16y^2 + 25)^{-3/2} dy$
34. $\int \frac{e^z - e^{-z}}{1 - e^{-z}} dz$
35. $\int_{\ln(1/2)}^{\ln 2} \tan \left(\frac{e^t - 1}{e^t + 1} \right) dt$
36. $\int_0^{1/e} e^{\sin^2 x} e^{\cos^2 x} dx$
37. $\int_{-1}^0 \frac{x^4 - 6x^2 + 4x + 3}{x^2 - 3x + 2} dx$
38. $\int \frac{\sec^2(\ln x) \tan^2(\ln x)}{3x} dx$
39. $\int \frac{1}{3x\sqrt{\ln(x^2) + 1}} dx$
40. $\int \frac{x^3}{(x^2 + 4)^{1/3}} dx$
41. $\int \sec^4(5x) dx$
42. $\int \tan^4(x/2) dx$
43. $\int \sin(3 \ln x) dx$
44. $\int \frac{11 - 5x}{x^3 + 3x^2 + 4x + 12} dx$
45. $\int \sin \theta \cos 2\theta \cos \theta d\theta$
46. $\int \frac{\sqrt{1 - x^2}}{x^2} dx$
47. $\int \frac{\sqrt{1 - x^2}}{x} dx$
48. $\int e^{-2x} \sin(x/2) dx$
49. $\int \sqrt{e^x} dx$
50. $\int \frac{\sqrt{1 + x}}{x} dx$
51. $\int \frac{x}{x^3 + 3x^2 + 3x + 1} dx$
52. $\int \frac{\cos^2 \theta + \sin \theta}{\sin 2\theta} d\theta$
53. $\int_0^{\pi/4} \frac{4}{1 + \tan x} dx$
54. $\int_2^9 \frac{1}{t\sqrt[3]{t - 1}} dt$
55. $\int \frac{1}{\sqrt{t}(\sqrt[3]{t} - 1)} dt$
56. $\int \frac{x \cos x}{\sin^3 x} dx$
57. $\int \frac{1}{\sqrt{3 - 4t - 4t^2}} dt$
58. $\int \sqrt{\tan^5 \theta \sec^4 \theta} d\theta$
59. $\int \frac{1}{\sin^2 t + \cos 2t} dt$
60. $\int \frac{1}{\sqrt{x} - \sqrt[4]{x}} dx$
61. $\int \frac{\cos^3 \pi t}{\sqrt{\sin \pi t}} dt$
62. $\int \frac{\sin^2(\tan \theta) \sec^2(\tan \theta)}{\cos^2 \theta} d\theta$
63. $\int \ln(\sqrt{t} + 1) dt$
64. $\int \frac{(x + 1)^2 \arctan(3x) + 9x^3 + x}{(9x^2 + 1)(x + 1)^2} dx$
65. $\int \sqrt{-t^2 - 10t} dt$
66. $\int_0^1 \arctan(1 - \sqrt{x}) dx$
67. $\int \cot 2\theta \sin \theta d\theta$
68. $\int \cot \theta \sin 2\theta d\theta$
69. $\int \cot 2\theta \sin 2\theta d\theta$
70. $\int \frac{3}{(x^2 + 3)^{3/2}} dx$
71. $\int \frac{x^2 + 3}{\sqrt{x^2 + 10x + 34}} dx$
72. $\int \frac{8x^2 - 4x - 9}{2x^3 + x^2 - 3x} dx$
73. $\int \frac{1}{1 - \cos \theta} d\theta$
74. $\int_0^1 \frac{x^3}{x^2 - 4x + 4} dx$
75. $\int_0^9 \sqrt{x + x\sqrt{x}} dx$
76. $\int \frac{1}{x\sqrt{1 - x^4}} dx$
77. $\int_{\pi/4}^{\pi/2} \cot \theta \ln(1 - \cos(2\theta)) d\theta$
78. $\int \sqrt{1 + \sqrt{1 + \sqrt{1 + x}}} dx$

79. $\int \frac{1}{x^{3/2} + \sqrt{x}} dx$
80. $\int \frac{\tan \theta}{\tan(2\theta)} d\theta$
81. $\int \frac{\tan(2\theta)}{\tan \theta} d\theta$

82. $\int \frac{1}{\sqrt{x+1} - \sqrt{x-1}} dx$
83. $\int_{-\pi/2}^{-\pi/3} \frac{3 \sin(2\theta)}{\sin^2 \theta - \cos \theta + 1} d\theta$
84. $\int \frac{x^{\ln x} \ln x}{x} dx$

85. $\int \frac{1}{x^4 + 1} dx$
86.* $\int \frac{1}{x(x^4 + 1)} dx$
87. $\int_{-\pi}^{\pi} \frac{\csc |x + \cot x|}{x \ln(x^4 + 16 - \cos(2x))} dx$

1. $2\sqrt{x} + 2x + \frac{2}{3}x^{3/2} + C$
2. $\frac{1}{2}x^2 + 2\ln|x+2|+C$
3. $\frac{1}{2}(e - \sqrt{2})$
4. $\frac{1}{4}e^{4x} + e^{2x} + x + C$
5. $\frac{1}{3}(e^{2x} + 1)^{3/2} + C$
6. $\frac{1}{2}\left(e^x\sqrt{e^{2x}+1} - \ln(e^x + \sqrt{e^{2x}+1})\right) + C$
7. $\sqrt{e^{2x}+1} + \frac{1}{2}\ln\frac{\sqrt{e^{2x}+1}-1}{\sqrt{e^{2x}+1}+1} + C$
8. $-2\ln(1 - \sqrt{x}) + C$
9. $\frac{1}{2}\tan x^2 + C$
10. $\frac{1}{4}\sin^2(x^2) + C$
11. $\frac{1}{32}\sin(4x) - \frac{1}{8}x\cos(4x) + C$
12. $\frac{7}{12}\tan^6(2\theta/7) + C$
13. $-\frac{1}{4}\cos(4\theta) + \frac{1}{6}\cos^3(4\theta) - \frac{1}{20}\cos^5(4\theta) + C$
14. $\frac{1}{12}\sec^3(4x) - \frac{1}{2}\sec(4x) - \frac{1}{4}\cos(4x) + C$
15. $\frac{1}{2}x^2\arctan x + \frac{1}{2}\arctan x - \frac{1}{2}x + C$
16. $\frac{1}{\sqrt{5}}\operatorname{arcsec}\frac{x}{\sqrt{5}} + C$
17. $\ln\frac{x^2+1}{|x+1|} + 3\arctan x + C$
18. $-\frac{\sqrt{6x-x^2}}{3x} + C$
19. $\frac{2}{3}\sin^3\theta + C$
20. $-\frac{1}{4}\ln^2\left(\frac{e+1}{x^2}\right) + C$
21. $\ln\frac{81}{16} - 3$
22. $\frac{5}{2} - \ln 8$
23. $-\frac{\sqrt{1-4x^2}}{x} + C$
24. $\frac{1}{4}\arcsin x^2 + \frac{1}{4}x^2\sqrt{1-x^4} + C$
25. $-\frac{3}{5}\csc^5\left(\frac{x}{3}\right) + \csc^3\left(\frac{x}{3}\right) + C$
26. $\frac{1}{5}x^5\ln x - \frac{1}{25}x^5 + C$
27. $\frac{1}{4}(e^2 - 3)$
28. $\sec x + \cos x - \frac{1}{3}\tan^3 x + C$
29. $\ln|e^x - 1| - \frac{1}{e^x - 1} + C$
30. $\ln\sqrt{x^2 + 2x + 5} + 2\arctan\frac{x+1}{2} + C$
31. $\frac{15}{4\sqrt{2}}\arcsin\frac{\sqrt{2}x}{\sqrt{3}} - \frac{5}{4}x\sqrt{3-2x^2} + C$
32. $\frac{1}{7}\cos^7\theta - \frac{1}{5}\cos^5\theta + C$
33. $\frac{40y^2+125}{128\sqrt{16y^2+25}} + C$
34. $e^z + z + C$
35. $0^\dagger$
36. 1
37. $\ln\frac{32}{27} - \frac{1}{6}$
38. $\frac{1}{9}\tan^3(\ln x) + C$
39. $\frac{1}{3}\sqrt{\ln(x^2)+1} + C$
40. $\frac{3}{10}(x^2-6)(x^2+4)^{2/3} + C$
41. $\frac{1}{5}\tan(5x) + \frac{1}{15}\tan^3(5x) + C$
42. $\frac{2}{3}\tan^3(x/2) - 2\tan(x/2) + x + C$
43. $\frac{1}{10}x(\sin(3\ln x) - 3\cos(3\ln x)) + C$
44. $\ln\frac{(x+3)^2}{x^2+4} + \frac{1}{2}\arctan\frac{x}{2} + C$
45. $-\frac{1}{16}\cos 4\theta + C$ or $\frac{1}{2}\sin^2\theta\cos^2\theta + C^\ddagger$
46. $-\arcsin x - \frac{\sqrt{1-x^2}}{x} + C$

47. $\sqrt{1-x^2} + \ln\frac{|x|}{\sqrt{1-x^2+1}} + C$
48. $-\frac{2}{17}e^{-2x}(4\sin(x/2) + \cos(x/2)) + C$
49. $2\sqrt{e^x} + C$
50. $2\sqrt{1+x} + \ln\left|\frac{\sqrt{1+x}-1}{\sqrt{1+x}+1}\right| + C$
51. $\frac{-2x-1}{2(x+1)^2} + C$
52. $\ln\sqrt{\tan\theta(1+\sin\theta)} + C$
53. $\frac{\pi}{2} + \ln 2$
54. $\frac{\sqrt{3}\pi}{6} + \ln\frac{2}{\sqrt{3}}$
55. $6\sqrt[6]{t} + \ln\left(\frac{1-\sqrt[6]{t}}{1+\sqrt[6]{t}}\right)^3 + C$
56. $-\frac{1}{2}x\csc^2x - \frac{1}{2}\cot x + C$
57. $\frac{1}{2}\arcsin\left(t + \frac{1}{2}\right) + C$
58. $\frac{2}{7}\tan^{7/2}\theta + C$
59. $\tan t + C$
60. $2\sqrt{x} + 4\sqrt[4]{x} + 4\ln|\sqrt[4]{x} - 1| + C$
61. $\frac{2\sqrt{\sin\pi t}}{5\pi}(5 - \sin^2\pi t) + C$
62. $\tan(\tan\theta) - \tan\theta + C$
63. $\sqrt{t} - \frac{t}{2} + (t-1)\ln(\sqrt{t}+1) + C$
64. $\frac{1}{6}(\arctan(3x))^2 + \ln|x+1| + \frac{1}{x+1} + C$
65. $\frac{25}{2}\arcsin\left(\frac{t+5}{5}\right) + \frac{1}{2}(t+5)\sqrt{-t^2-10t} + C$
66. $1 - \ln 2$
67. $\sin\theta - \frac{1}{2}\ln|\sec\theta + \tan\theta| + C$
68. $\theta + \sin\theta\cos\theta + C$
69. $\frac{1}{2}\sin 2\theta + C$
70. $\frac{x}{\sqrt{x^2+3}} + C$
71. $\frac{1}{2}(x-15)\sqrt{x^2+10x+34} + \frac{47}{2}\ln\left|\sqrt{x^2+10x+34} + x + 5\right| + C$
72. $\ln\left|\frac{x^3(2x+3)^2}{x-1}\right| + C$
73. $-\cot\theta - \csc\theta + C$
74. $\frac{17}{2} - \ln 4096$
75. $\frac{3392}{15}$
76. $\ln\sqrt{\frac{x^2}{\sqrt{1-x^4}+1}} + C$
77. $\frac{1}{4}(\ln 2)^2$
78. $\frac{8}{9}\left(1 + \sqrt{1 + \sqrt{1+x}}\right)^{9/2} - \frac{24}{7}\left(1 + \sqrt{1 + \sqrt{1+x}}\right)^{7/2} + \frac{16}{5}\left(1 + \sqrt{1 + \sqrt{1+x}}\right)^{5/2} + C$
79. $2\arctan\sqrt{x} + C$
80. $\theta - \frac{1}{2}\tan\theta + C$
81. $\theta + \ln\sqrt{\frac{\sin x + \cos x}{\sin x - \cos x}} + C$
82. $\frac{1}{3}(x+1)^{3/2} + \frac{1}{3}(x-1)^{3/2} + C$
83. $\ln\left(\frac{625}{1024}\right)$
84. $\frac{1}{2}x^{\ln x} + C$
85. $\frac{1}{4\sqrt{2}}\left(\ln\left|\frac{x+2\sqrt{x}+1}{x-2\sqrt{x}+1}\right| - 2\arctan(1-2\sqrt{x}) + 2\arctan(1+2\sqrt{x})\right) + C$
86. $\ln\frac{x}{\sqrt[4]{x^4+1}} + C$
87. $0^\dagger$

*Don't use the same initial approach as in the problem above.

†Make sure you can *show* how to get this answer.

‡There are many equivalent forms for this answer.