

Integration Problems to Work on in Preparation for the Technique Test
UPDATED

October 10, 2002

1. $\int x \sec^2 x \, dx$
2. $\int \frac{4x+4}{2x+1} dx$
3. $\int 7xe^{x^2} \, dx$
4. $\int \frac{dx}{x^2+6x+9}$
5. $\int_{-10}^{10} \sin(x^3) \, dx$
6. $\int_1^9 \sqrt{4+3x} \, dx$
7. $\int e^x \sqrt{1-e^{2x}} \, dx$
8. $\int e^x \sin x \, dx$
9. $\int x \ln x \, dx$
10. $\int \sin^2(7x) \, dx$
11. $\int \frac{4x^3+3x^2+2x+1}{x^4+x^3+x^2+x+1} dx$
12. $\int \frac{6x+3}{(x-1)(x-2)(x-3)} dx$
13. $\int x \cos(x^2) \, dx$
14. $\int x^2 \cos x \, dx$
15. $\int \cos(x^2) \, dx$ (Use series.)
16. $\int \cos^2 x \, dx$
17. $\int x^3 \cos x^2 \, dx$
18. $\int \cos^3 x \, dx$
19. $\int_1^e \ln x \, dx$
20. $\int (\ln x)^2 \, dx$
21. $\int \frac{(\ln x)^2}{x} \, dx$
22. $\int_e^{e^3} \frac{1}{x \ln x} \, dx$
23. $\int x \ln(x^2 + 1) \, dx$
24. $\int \frac{x^2-1}{x^2+1} \, dx$
25. $\int \frac{x^2+1}{x^2-1} \, dx$
26. $\int \frac{x}{x^4+1} \, dx$
27. $\int \frac{x}{\sqrt{x^2+1}} \, dx$
28. $\int \frac{e^x}{e^{2x}-4} \, dx$
29. $\int \frac{e^{2x}}{e^{2x}-4} \, dx$
30. $\int_0^{\ln 3} \frac{e^x}{\sqrt{e^x+4}} \, dx$
31. $\int \frac{x+5}{x^2-2x-3} \, dx$
32. $\int \frac{x^2+3}{x^2+1} \, dx$
33. $\int x^2 e^{x^3} \, dx$
34. $\int 3 \tan(2x) \, dx$
35. $\int e^{\tan x} \sec^2 x \, dx$
36. $\int \cos x \sin(2 \sin x) \, dx$
37. $\int -\frac{\ln(1+x)}{(1+x)^2} \, dx$
38. $\int \frac{2}{x^2+2x+1} \, dx$
39. $\int \frac{1}{x(x+2)} \, dx$
40. $\int \frac{x^2}{(1-9x^2)^{(3/2)}} \, dx$
41. $\int 3x \cos x \, dx$
42. $\int (x\sqrt{x^2+2x} + \sqrt{x^2+2x}) \, dx$
43. $\int_1^e \frac{\sin(\ln(x))}{x} \, dx$
44. $\int \sin(\ln(x)) \, dx$
45. $\int \frac{3}{x^2(x^2+9)} \, dx$
46. $\int \frac{x^3}{x^2+1} \, dx$
47. $\int \frac{dx}{x^3+x}$
48. $\int \frac{\sin(x) dx}{\cos^2(x)-5 \cos(x)+4}$
49. $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} \, dx$
50. $\int \sqrt{9-4x^2} \, dx$
51. $\int \frac{x+1}{x^2+1} \, dx$

52. $\int 2xe^{(x+1)^2} + 2e^{(x+1)^2} dx$
53. $\int \cos^2(x) - \sin^2(x) dx$
54. $\int \frac{x}{\sqrt{1-x^2}} dx$
55. $\int x \sin((x+1)(x-1)) dx$
56. $\int \frac{x^5-1}{x-1} dx$
57. $\int 2x((x^2+1)^2+1)^2 dx$
58. $\int_{-\pi/2}^{\pi/2} \frac{x^3}{\sqrt{1-x^2}} dx$
59. $\int_1^e x^2 \ln x dx$
60. $\int \sin x \cos x dx$
61. $\int \frac{dx}{x \ln x \ln(\ln x)}$
62. $\int \frac{dx}{(1-x^2)^{3/2}}$
63. $\int \sin^3(2x) dx$
64. $\int \ln \sqrt{x} dx$
65. $\int \frac{x+1}{x^2-4} dx$
66. $\int \frac{1}{(x^2+1)^{3/2}} dx$
67. $\int e^{e^x+x} dx$
68. $\int \frac{\cos(x)}{1+\sin(x)} dx$
69. $\int \frac{x^3+1}{x^2-1} dx$
70. $\int \frac{1}{x(x^2+a^2)} dx$
71. $\int_{1/2}^1 \frac{1}{x^2\sqrt{1-x^2}} dx$
72. $\int_1^\infty \frac{\ln(x)}{x^2} dx$
73. $\int \frac{x}{(x^2-a^2)^{3/2}} dx$
74. $\int x(\ln x)^2 dx$
75. $\int_0^1 \frac{1}{1+x^{1/3}} dx$
76. $\int \tan^2 x dx$
77. $\int_0^{\frac{1}{2} \ln 3} \frac{1}{e^x+e^{-x}} dx$
78. $\int_0^1 \frac{1}{\sqrt{1-x^2}} dx$
79. $\int_0^1 x^5 \ln x dx$
80. $\int_1^2 \frac{e^{-\frac{1}{x}}}{x^2} dx$
81. $\int \frac{x}{\sqrt{x^2+3}} dx$
82. $\int e^{\ln x} dx$
83. $\int \frac{(x-1)dx}{(x^2+1)(x+1)}$
84. $\int_0^1 \sqrt{1-x^2} x^2 dx$
85. $\int \cos(x) \ln(\sin(x)) dx$
86. $\int \frac{\sqrt{x} dx}{x+1}$
87. $\int (\sqrt{\ln x}/x) dx$
88. $\int x^2 e^x dx$
89. $\int (\sin x)^3 dx$
90. $\int \ln(x^2+1) dx$
91. $\int \frac{\ln(\ln x)}{x} dx$