Integration Problems to Work on in Preparation for the Technique Test

February 10, 2003

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. $\int x \arctan x dx$
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. $\int \frac{2x+1}{x^2+4x-5} dx$
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. $\int \frac{2x}{e^x} dx$
51. $\int \frac{x+1}{x^2+1} dx$
52. $\int 2xe^{(x+1)^2} + 2e^{(x+1)^2} \, dx$
53. $\int \frac{2-3x}{(x^2(x-1))} dx$

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. $\int_{-1/2}^{1/2} \frac{x^3}{\sqrt{1-x^2}} dx$

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. $\int \sin^3(2x)\, dx$

63. $\int \ln \sqrt{x}\, dx$

64. $\int \frac{x+1}{x^2-4}\, dx$

65. $\int e^{e^x+x}\, dx$

66. $\int \frac{\cos(x)}{1+\sin(x)}\, dx$

67. $\int \frac{x^3+1}{x^2-1}\, dx$

68. $\int \frac{1}{x(x^2+a^2)}\, dx$

69. $\int \frac{x}{(x^2-a^2)^{3/2}}\, dx$

70. $\int x(\ln x)^2 dx$

71. $\int_0^1 \frac{1}{1+x^{\frac{1}{3}}} dx$

72. $\int \tan^2 x\, dx$

73. $\int_0^{\frac{1}{2}\ln 3} \frac{1}{e^x+e^{-x}} dx$

74. $\int_0^1 x^5 \ln x\, dx$

75. $\int_1^2 \frac{e^{-\frac{1}{x}}}{x^2} dx$

76. $\int \frac{x}{\sqrt{x^2+3}} dx$

77. $\int e^{\ln x} dx$

78. $\int \frac{(x-1)dx}{(x^2+1)(x+1)}$

79. $\int \cos(x) \ln(\sin(x))\, dx$

80. $\int \frac{\sqrt{x}\, dx}{x+1}$

81. $\int (\sqrt{\ln x}/x)\, dx$

82. $\int x^2 e^x\, dx$

83. $\int \ln(x^2+1)\, dx$

84. $\int \frac{\ln(\ln x)}{x} dx$