

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

March 14, 2002

- $\int e^x \sqrt{1 - e^{2x}} dx$
- $\int x \sec^2 x dx$
- $\int \frac{4x+4}{2x+1} dx$
- $\int 7xe^{x^2} dx$
- $\int \frac{dx}{x^2+6x+9}$
- $\int_{-10}^{10} \sin(x^3) dx$
- $\int_1^9 \sqrt{4+3x} dx$
- $\int e^x \sin x dx$
- $\int x \ln x dx$
- $\int \sin^2(7x) dx$
- $\int \frac{4x^3+3x^2+2x+1}{x^4+x^3+x^2+x+1} dx$
- $\int \frac{6x+3}{(x-1)(x-2)(x-3)} dx$
- $\int x \cos(x^2) dx$
- $\int x^2 \cos x dx$
- $\int \cos(x^2) dx$  (Use series.)
- $\int \cos^2 x dx$
- $\int x^3 \cos x^2 dx$
- $\int \cos^3 x dx$
- $\int_1^e \ln x dx$
- $\int (\ln x)^2 dx$
- $\int \frac{(\ln x)^2}{x} dx$
- $\int_e^{e^3} \frac{1}{x \ln x} dx$
- $\int x \ln(x^2 + 1) dx$
- $\int \frac{x^2-1}{x^2+1} dx$
- $\int \frac{x^2+1}{x^2-1} dx$
- $\int \frac{x}{x^4+1} dx$
- $\int \frac{x}{\sqrt{x^2+1}} dx$
- $\int \frac{x}{\sqrt{9x^2-4}} dx$
- $\int \frac{e^x}{e^{2x}-4} dx$
- $\int \frac{e^{2x}}{e^{2x}-4} dx$
- $\int_0^{\ln 3} \frac{e^x}{\sqrt{e^x+4}} dx$
- $\int \frac{x+5}{x^2-2x-3} dx$
- $\int \frac{x^2+3}{x^2+1} dx$
- $\int \sqrt{4-x^2} dx$
- $\int \arctan(5x) dx$
- $\int x^2 e^{x^3} dx$
- $5 \int \sin(3x) \cos(3x) dx$
- $3 \int \tan(2x) dx$
- $\int e^{\tan x} \sec^2 x dx$
- $\int \cos x \sin(2 \sin x) dx$
- $-\int \frac{\ln(1+x)}{(1+x)^2} dx$
- $\int \frac{x^3}{x^2+2x+1} dx$
- $\int \frac{2}{x^2+2x+1} dx$
- $\int \frac{1}{x(x+2)} dx$
- $\int \frac{x^2}{(1-9x^2)^{(3/2)}} dx$
- $\int 3x \cos x dx$
- $\int (x\sqrt{x^2+2x} + \sqrt{x^2+2x}) dx$
- $\int \cos(2x)e^{3x} dx$
- $\int_1^e \frac{\sin(\ln(x))}{x} dx$
- $\int \sin(\ln(x)) dx$
- $\int_0^4 e^{\sqrt{x}} dx$
- $\int \frac{3}{x^2(x^2+9)} dx$

53.  $\int \frac{x^3}{x^2+1} dx$
54.  $\int \frac{dx}{x^3+x}$
55.  $\int \frac{\sin(x)dx}{\cos^2(x)-5\cos(x)+4}$
56.  $\int \frac{dx}{e^x-1}$
57.  $\int \frac{x^4-2x^3+4x^2-4}{x^2-x-2} dx$
58.  $\int_0^1 \frac{dx}{\sqrt{4-x^2}}$
59.  $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$
60.  $\int \sqrt{9-4x^2} dx$
61.  $\int \frac{x+1}{x^2+1} dx$
62.  $\int 2xe^{(x+1)^2} + 2e^{(x+1)^2}$
63.  $\int \cos^2(x) - \sin^2(x) dx$
64.  $\int \frac{x}{\sqrt{1-x^2}} dx$
65.  $\int x \sin((x+1)(x-1)) dx$
66.  $\int \frac{x^5-1}{x-1} dx$
67.  $\int 2x((x^2+1)^2+1)^2 dx$
68.  $\int_{-\pi/2}^{\pi/2} \frac{x^3}{\sqrt{1-x^2}} dx$
69.  $\int_1^e x^2 \ln x dx$
70.  $\int \sin x \cos x dx$
71.  $\int \frac{dx}{x \ln x \ln(\ln x)}$
72.  $\int \frac{dx}{(1-x^2)^{3/2}}$
73.  $\int \sin^3(2x) dx$
74.  $\int \ln \sqrt{x} dx$
75.  $\int \frac{x+1}{x^2-4} dx$
76.  $\int \frac{1}{(x^2+1)^{3/2}} dx$
77.  $\int e^{e^x+x} dx$
78.  $\int \frac{\cos(x)}{1+\sin(x)} dx$
79.  $\int \frac{x^3+1}{x^2-1} dx$
80.  $\int \frac{1}{x(x^2+a^2)} dx$
81.  $\int_{1/2}^1 \frac{1}{x^2\sqrt{1-x^2}} dx$
82.  $\int_1^\infty \frac{\ln(x)}{x^2} dx$
83.  $\int \frac{x}{(x^2-a^2)^{3/2}} dx$
84.  $\int x^3 \sin(x^2) dx$
85.  $\int x(\ln x)^2 dx$
86.  $\int_0^1 \frac{1}{1+x^{\frac{1}{3}}} dx$
87.  $\int_1^3 \frac{1}{x(x+3)} dx$
88.  $\int \tan^2 x dx$
89.  $\int_0^{\frac{1}{2} \ln 3} \frac{1}{e^x+e^{-x}} dx$
90.  $\int_0^1 \frac{1}{\sqrt{1-x^2}} dx$
91.  $\int_0^1 x^5 \ln x dx$
92.  $\int_1^2 \frac{e^{-\frac{1}{x}}}{x^2} dx$
93.  $\int \frac{x}{\sqrt{x^2+3}} dx$
94.  $\int e^{ln x} dx$
95.  $\int \frac{(x-1)dx}{(x^2+1)(x+1)}$
96.  $\int_0^1 \sqrt{1-x^2} x^2 dx$
97.  $\int \cos(x) \ln(\sin(x)) dx$
98.  $\int \frac{\sqrt{x} dx}{x+1}$
99.  $\int \sqrt{\ln x} / x dx$
100.  $\int x^2 e^x dx$
101.  $\int (\sin x)^3 dx$
102.  $\int \ln(x^2+1) dx$
103.  $\int \frac{\ln(\ln x)}{x} dx$