

Evaluate the following integrals.

1.  $\int \frac{\sqrt{x} + x^2}{\sqrt[4]{x}} dx$  [2002]

2.  $\int \sin x \cos x dx$  [2000]

3.  $\int \frac{x}{\sqrt{2x-1}} dx$  [2000]

4.  $\int \cos^2 x - \sin^2 x dx$  [2001]

5.  $\int \frac{1}{x\sqrt{x^2+1}} dx$  [2001]

$$\frac{4}{5}x^{5/4} + \frac{4}{11}x^{11/4} - \frac{1}{4}\cos(2x).$$

$$\frac{x+1}{3}\sqrt{2x-1} + c$$

$$\frac{1}{2}\sin(2x) + c$$

$$\ln \left| \frac{\sqrt{x+1}-1}{\sqrt{x+1}+1} \right| + c$$

6.  $\int e^{-2x} \sin(3x) dx$  [2002]

$$\frac{1}{13}e^{-2x} [-2 \sin (3x) - 3 \cos (3x)]$$

Evaluate the following integrals.

1.  $\int_0^2 x\sqrt{4-x^2}dx$  [2000]

2.  $\int_0^{\frac{\pi}{4}} \tan x \sec^2 x dx$  [2000]

3.  $\int_0^1 \frac{x}{\sqrt{x^2+1}} dx$  [2001]

4.  $\int \frac{(\ln x)^2}{x} dx$  [2001]

5.  $\int e^x \cos(e^x + 3) dx$  [2002]

6.  $\int_0^5 x\sqrt{25-x^2}dx$  [2002]

$$\frac{8}{3}$$

$$\frac{1}{2}$$

$$\sqrt{2} - 1$$

$$\frac{1}{3} [\ln(x)]^3$$

$$\sin(e^x + 3)$$

$$-\frac{(25 - x^2)^{3/2}}{3}$$

Evaluate the following integrals.

1.  $\int \frac{3}{5x - 1} dx$  [2000]

2.  $\int_0^{\frac{\pi}{2}} \frac{\cos \theta}{1 + \sin \theta} d\theta$  [2001]

$$\frac{3}{5} \ln |5x - 1|$$

$$\ln 2.$$