Worksheet

Problem 1 *Evaluate the following integrals using the fundamental theorem of calculus.*

$$\int_0^1 x^{\pi-1}dx \qquad \int_0^1 \pi^{x-1}dx \qquad \int_0^1 (t+1)(t^2+4)dt$$

$$\int_0^1 \cos^2 t dt \qquad \int_0^1 \frac{dx}{\cos^2 x} \qquad \int_{\pi/2}^{\pi} \frac{sin(2x)}{2sinx}dx$$

$$\int_0^1 \frac{dt}{(t+1)(t+2)} \qquad \int_0^{\pi} \frac{1}{2}(\cos x + |\cos x|)dx$$

Problem 2 *Evaluate dy/dx for the following functions.*

$$y = \int_0^x \sqrt{1+t^2}dt \qquad y = \int_{\sqrt{x}}^0 \sin(t^2)dt \qquad y = \int_2^{x^2} sin(x^2)sin(t^2)dt$$

Problem 3 *Using u-substitution to evaluate the following indefinite integrals*

$$\int \frac{dx}{e^{-x}+e^{x}} \qquad \int \frac{dx}{xlnx}$$

$$\int \sqrt{\sin x}\cos^3 x dx \qquad \int \frac{dx}{1+e^{x}}$$