Test I, March 30th, 2010

Exercise 1. Integrate **(a)** $\int \frac{x}{1+x^4}dx$, **(b)** $\int \frac{dx}{x\ln^2 x}$. *(1 pt each)*

Exercise 2. Integrate **(a)** $\int x\ln x dx$, **(b)** $\int x^2 \sin x dx$. *(1.5 pts each)*

Exercise 3. Integrate $\int \frac{dx}{x^2+4x+6}$. *(2 pts)*

Exercise 4. Find the area of the region bounded by the graphs of $y = \sin x$, $y = \cos x$ and the OX axis $(0 \leq x \leq \frac{\pi}{4})$. Draw the region. *(4 pts)*

Exercise 5. (a) Find the volume of a solid of revolution created by revolving the $y = \cos x$ graph in the interval of $[-\frac{\pi}{4}, \frac{\pi}{4}]$. Draw the solid. *(3 pts)*

(b) Give an application of a definite integral other then the ones used in exercises **(4)** and **(5a)**. *(1 pt)*