MATH 1080, SPRING 2006, HW SET 11

You need to show all your work and explain with following the guideline described in the class webpage to get the full credit. And please staple your HW papers.

HW 11 Due on Tuesday 04/25/06

Before doing this HW, go over the definitions with examples given in class.

Note that $\cos^3 x = (\cos x)^3$ and $\sin^5 x = (\sin x)^5$.

1. Evaluate the following:
   (1) $\int_2^{e^3+1} \frac{\ln(x-1)}{(x-1)} dx$
   (2) $\int_0^1 x(2x^2+1)^{20} dx$
   (3) $\int_0^{\frac{\pi}{6}} (\cos^3 x) dx$
   (4) $\int_{\frac{\pi}{2}}^{\pi} (\sin^5 x) dx$
   (5) $\int_1^3 (x-1)e^{x^2-2x-1} dx$

2. Find the volume of the solid of revolution of the region surrounded by the graph of f and the x-axis about the given axis. Specify your method (either the Disk Method or the Shell(Washer) Method).
   (1) $f(x) = 2x+1$ between $x=0$ and $x=2$ about the x-axis.
   (2) $f(x) = 2x+1$ between $x=0$ and $x=2$ about the y-axis.
   (3) $f(x) = \sqrt{x^2-1}$ between $x=1$ and $x=4$ about the x-axis.
   (4) $f(x) = \sqrt{x^2-1}$ between $x=1$ and $x=4$ about the y-axis.

3. Find the volume of the solid obtained by rotating the region surrounded by the graph of $f(x)$ and the x-axis about the given axis. Specify your method (either the Disk Method or the Shell(Washer) Method).
   (1) $f(x) = -(x-1)(x-3)^2$ about the y-axis.
   (2) $f(x) = x(x-1)(x-2)$ about the y-axis.

Date: Due on **Tuesday** 04/25/06.