Ma 227 **Exam II** **11/8/10**

Name: ________________________________

Lecture Section: ______

I pledge my honor that I have abided by the Stevens Honor System. ___________________________________

You may not use a calculator, cell phone, or computer while taking this exam. All work must be shown to obtain full credit. Credit will not be given for work not reasonably supported. When you finish, be sure to sign the pledge.
There is a table of integrals on the last page of the exam.

Score on Problem #1 ________

#2a ________

#2b ________

#3 ________

#4 ________

Total Score ________

1 [25 **pts**.] Set up iterated integrals for both orders of integration for

$$\iint_D y^2 e^{xy}\, dA, \quad D \text{ is bounded by } y = x, y = 4, x = 0$$

Sketch D and evaluate this double integral.

2 a $\left[20 \ \textbf{pts.}\right]$ Evaluate

$$\iint_R x\,dA$$

where R is the region in the first quadrant that lies between the circles $x^2 + y^2 = 1$ and $x^2+y^2 = 2$. Sketch R.

2 b $\left[15 \textbf{ pts.}\right]$ Give an integral for the surface area of the part of the surface $z = x^2 + y$ that lies above the triangle in the x, y –plane with vertices $(0,0), (1,0),$ and $(0,2)$. Sketch the triangle. DO NOT EVALUATE THIS INTEGRAL.

3 $\left[20 \textbf{ pts}.\right]$ Use cylindrical coordinates to set up and iterated triple integral for the volume bounded by the cylinder $x^2 + y^2 = 4$ and the planes $z = 0$ and $y + z = 3$. Evaluate this integral.

4 [20 **pts**.] Use spherical coordinates to evaluate

$$\int_{-2}^{2}\int_{0}^{\sqrt{4-y^2}}\int_{-\sqrt{4-x^2-y^2}}^{\sqrt{4-x^2-y^2}} y^2\sqrt{x^2+y^2+z^2}\,dzdxdy$$

Table of Integrals

$\int \sin^2 x dx = -\frac{1}{2}\cos x \sin x + \frac{1}{2}x + C$
$\int \cos^2 x dx = \frac{1}{2}\cos x \sin x + \frac{1}{2}x + C$
$\int \sin^3 x dx = -\frac{1}{3}\sin^2 x \cos x - \frac{2}{3}\cos x + C$
$\int \cos^3 x dx = \frac{1}{3}\cos^2 x \sin x + \frac{2}{3}\sin x + C$
$\int te^{at} dt = \frac{1}{a^2}e^{at}(at - 1) + C$
$\int t^2 e^{at} dt = \frac{1}{a^3}e^{at}\left(a^2t^2 - 2at + 2\right) + C$