MATH 22005 HOMEWORK #6 (20 pts) SPRING 2006
SHOW ALL WORK FOR FULL CREDIT — PLEASE CIRCLE FINAL ANSWER

DUE: TUESDAY, MARCH 14, 2006 AT THE BEGINNING OF CLASS

1. (1 pt) Calculate the iterated integral $\int_1^3 \int_0^7 xy\,dx\,dy$.

2. (2 pts) Calculate the double integral $\iint_R \frac{1+x^2}{1+y^2}\,dA$, where $R = [0,1] \times [0,1]$.

3. (3 pts) Evaluate the double integral $\iint_D (x+y)\,dA$, where D is bounded by $y = \sqrt{x}$ and $y = x^2$.

4. (3 pts) Find the volume of the solid bounded by $z = 1 + (x-1)^2 + 4y^2$, the planes $x = 3$ and $y = 2$ and the coordinate planes.

5. (3 pts) Find the volume of the solid bounded by the surface $z = 6 - xy$ and the planes $x = 2$, $x = -2$, $y = 0$, $y = 3$, and $z = 0$.

6. (3 pts) Find the volume of the solid bounded by the cylinder $y^2 + z^2 = 4$ and the planes $x = 2y$, $x = 0$, $z = 0$ in the first octant. (Recall that in the first octant $z \geq 0$).

7. (3 pts) Evaluate the integral by reversing the order of integration

$$\int_0^1 \int_{\sqrt{y}}^1 \sqrt{x^3+1}\,dx\,dy.$$

8. (1 pt each) Given

$$\int_0^1 \int_{\arctan x}^{\pi/4} f(x,y)\,dy\,dx$$

   (a) Sketch the region of integration.

   (b) Change the order of integration.