

Your name:

Instructor (please circle):

Barnett

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**Math 11 Fall 2010: written part of HW6 (due Wed Nov 3)**

*Please show your work. No credit is given for solutions without justification.*

- (1) [8 points] Evaluate the following integral by changing to polar coordinates,

$$\int_0^2 \int_0^{\sqrt{2x-x^2}} \frac{1}{\sqrt{x^2+y^2}} dy dx.$$

(2) [10 points] Let  $E$  be the solid region bounded by the surface  $y = x^2$  and the two planes  $z = 0$  and  $y + z = 1$ .

(a) Explain, without calculating the integral, why the value of the triple integral  $\iiint_E z \, dV$  must be less than the volume of the solid  $E$ .

(b) Evaluate the triple integral  $\iiint_E z \, dV$ .

(3) [8 points] Consider the iterated integral

$$\int_{-1}^1 \int_{-\sqrt{1-y^2}}^{\sqrt{1-y^2}} \int_{-1}^x f(x, y, z) dz dx dy.$$

Rewrite this integral as an equivalent iterated integral in the form

$$\int \int \int f(x, y, z) dy dx dz.$$