

Name: \_\_\_\_\_ ID #: \_\_\_\_\_ Section #: \_\_\_\_\_

**Question 1: [4.5 pts]** Evaluate the following integrals:

a)  $\int_0^1 \int_0^{x^2} 2x \sin y \, dy dx$

b)  $\int_0^1 \int_{x^{1/3}}^1 \sqrt{y^4 + 1} \, dy dx$

**Question 2: [2.5 pts]** Convert the integral to polar coordinates (do not evaluate the integral):

$$I = \int_0^1 \int_y^{\sqrt{2y-y^2}} \sqrt{x^2 + y^2} \, dx dy$$

**Question 2: [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.