MATH 213 – QUIZ 10 – 20 APRIL 2006

Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.

1. (4 pts.) Evaluate the iterated integral $\int_1^2 \int_0^x \int_0^y (x^2 + y)\, dz\, dy\, dx$

$$= \int_1^2 \int_0^x x^2 z + yz \Big|_0^y dy\, dx = \int_1^2 \int_0^x x^2 y + y^2\, dy\, dx$$

$$= \int_1^2 \frac{1}{2}x^2y^2 + \frac{1}{3}y^3 \Big|_0^x dx = \int_1^2 \frac{1}{2}x^4 + \frac{1}{3}x^3\, dx$$

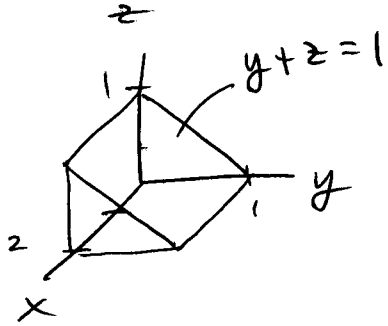
$$= \frac{1}{10}x^5 + \frac{1}{12}x^4 \Big|_1^2 = \frac{32}{10} + \frac{16}{12} - \frac{1}{10} + -\frac{1}{12}$$

$$= \frac{31}{10} + \frac{15}{12} = \frac{62}{20} + \frac{25}{20} = \frac{87}{20} \;//$$

2. (3 pts. each) Let D be the solid region in the first octant bounded by the planes $x = 2$ and $y + z = 1$ (see sketch on board). Write but DO NOT EVALUATE the triple integral $\iiint_D x + yz - x^2y\, dV$ as an iterated triple integral in the order

(a) $dz\, dx\, dy$

$$\int_0^1 \int_0^2 \int_0^{1-y} (x + yz - x^2y)\, dz\, dx\, dy$$



(b) $dx\, dy\, dz$

$$\int_0^1 \int_0^{1-z} \int_0^2 (x + yz - x^2y)\, dx\, dy\, dz$$