MATH 213 – QUIZ 10 – 10 APRIL 2008

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. (3 pts. each) Evaluate the following double integrals.

(a) $\int_1^3 \int_0^1 (1+4xy)\,dx\,dy$ $= \int_1^3 \left[x+2x^2y \,\Big|_0^1 \right] dy = \int_1^3 1+2y\,dy$

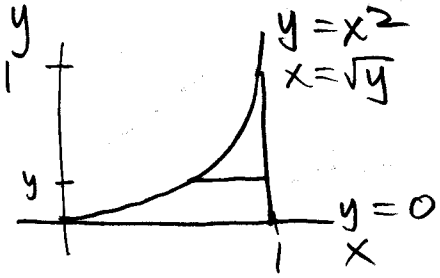
$= y+y^2\Big|_1^3 = 3+9-1-1 = 10$ //

(b) $\int_0^1 \int_x^{2-x} x^2\,dy\,dx$ $= \int_0^1 \left[x^2 y \,\Big|_{y=x}^{y=2-x} \right] dx = \int_0^1 (x^2(2-x)-x^3)\,dx$

$= \int_0^1 (2x^2-2x^3)\,dx = \frac{2}{3}x^3 - \frac{1}{2}x^4\Big|_0^1 = \frac{2}{3}-\frac{1}{2} = \frac{1}{6}$ //

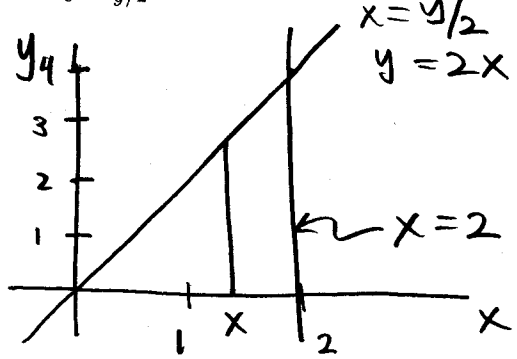
2. (2 pts. each) Reverse the order of integration in each of the following integrals. Do not evaluate. (Hint: It will be helpful to sketch the region before reversing the order.)

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



$= \int_0^1 \int_{\sqrt{y}}^1 x^2\,dx\,dy$ //

(b) $\int_0^4 \int_{y/2}^2 x^2\,dx\,dy$



$= \int_0^2 \int_0^{2x} x^2\,dy\,dx$ //