

## Practice Quiz # 10.

1. Compute the double integral:

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

2. Reverse the order of integration in the above integral, and compute the (same!) result.
3. Set up (but do not compute) the integral which computes the volume beneath the surface  $z = 10 - x^2 - y^2$  over the region in the first quadrant bounded by the circle  $x^2 + y^2 = 4$ .
4. Find  $M_y$  for a thin plate bounded by  $y = 0$ ,  $y = x$  and  $x = 2$  if the density of the plate is  $\delta(x, y) = 2x$ . [Find only  $M_y$ . I claim  $M = 16/3$ , if you wish to check your work.]

### Answers to Practice Quiz # 10.

**Solution 1.**  $2/15$

**Solution 2.**

$$\int_0^1 \int_y^{\sqrt{y}} 2y \, dx \, dy = \dots = 2/15$$

**Solution 3.** Two possible answers (depends on order of integration):

$$V = \int_0^2 \int_0^{\sqrt{4-x^2}} 10 - x^2 - y^2 \, dy \, dx;$$

$$V = \int_0^2 \int_0^{\sqrt{4-y^2}} 10 - x^2 - y^2 \, dx \, dy.$$

**Solution 4.** Again, two integrals are possible:

$$M_y = \int_0^2 \int_y^2 x(2x) \, dx \, dy = \dots = 8;$$

$$M_y = \int_0^2 \int_0^x x(2x) \, dy \, dx = \dots = 8.$$