Worksheet 12

March 12, 2008

1. Sketch the solid whose volume is given by

$$\int_0^2 \int_0^2 (8 - x^2 - y^2)\, dx\, dy.$$

   Find its volume by evaluating the integral.

2. (a) Evaluate

$$\int_0^1 \int_0^1 \frac{x-y}{(x+y)^3}\, dx\, dy$$

   by partial fractions.

   (b) Evaluate

$$\int_0^1 \int_0^1 \frac{x-y}{(x+y)^3}\, dy\, dx$$

   (c) How is this possible?

   (d) What can you say about

$$\iint_R \frac{x-y}{(x+y)^3}\, dA,$$

   where R is the region $0 \le x \le 1$, $0 \le y \le 1$?

3. Continue to work on the gutter problem from Monday.