Problem Set for 15.3

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March 23, 2006

Recommended problems from book: 1-23 odd. I suggest doing problems in both integration orders where possible. 37, 39, 43, 45.

1. Compute the volume of the solid bounded below by the triangular region in the \(xy\) plane with corners \((0, 0), (0, 1),\) and \((2, 1)\) and above by the surface \(z = xy\).

   Set up and evaluate the iterated integrals in both orders which represent the volume of this region and evaluate both of them.

2. Set up and evaluate an iterated integral representing the volume of the region bounded below by the upper half of the region bounded by the unit circle in the \(xy\) plane and above by the surface \(z = y\).

3. Sketch the region over which \(f(x, y)\) is being integrated in

   \[ \int_0^2 \int_{x^3}^{4x} f(x, y) \, dy \, dx \]

   and rewrite the integral with the other order of integration.