

Class exercises for Week 5. To be done in class. These exercises do not need to be returned, and they are not marked.

1. Reverse the order of integration for

$$\int_0^1 \int_0^{2x^2+1} f(x, y) dy dx.$$

That is, write as an integral of the form $\iint \dots dx dy$.

2. A swimming pool is circular with a 40 meter diameter. The depth is constant along east-west lines and increases linearly from 2 meters at the south end to 7 meters at the north end. Find the volume of the pool.
3. Find the center of mass of a two-dimensional plate that occupies the region enclosed by the parabolas $x = y^2$, $y = x^2$ and has density function

$$\rho(x, y) = \sqrt{x}.$$

Sketch the plate and its center of mass.

4. David Guichard and friends , Section 15.1, Exercises: 1, 3, 10, and 20.
5. David Guichard and friends , Section 15.2, Exercises: 2, 6 and 12.