

Math 13 - Winter 2014

Homework 3

Due Wednesday, 29 Jan. 2014.

1. Section 15.4 #22.
2. Section 15.4 #32.
3. Section 15.7 #20.
4. Section 15.5 #14.
5. Section 15.9 #20.

6. Let E be the region above the cone $z = \sqrt{3(x^2 + y^2)}$ and below the plane $z = \sqrt{3}$. Consider the triple integral

$$\int \int \int_E \sqrt{x^2 + y^2 + z^2} dV.$$

- (a) Express the triple integral as an iterated integral in cylindrical coordinates. (Do not evaluate yet.)
- (b) Express the triple integral as an iterated integral in spherical coordinates. (Do not evaluate yet.)
- (c) Choose one of the iterated integrals that you found in parts (a) and (b) and evaluate it. (You might find the one in part (b) easier.)
- (d) Find the average distance from points in the cone E to the vertex of E , i.e., the average distance from points in E to the origin. (Note: You've already done almost all the work. You may use the formula $\frac{1}{3}\pi R^2 H$ for the volume of a cone of radius R and height H .)