Practice for Quiz 13
Math 2580
Spring 2016

Sean Fitzpatrick

March 3rd, 2016

If you can answer the following problems, you should be well-prepared for Quiz 13:

1. Evaluate $\iint_D (x^2+y^2)^{3/2}\,dA$, where D is the disc $x^2+y^2 \leq 4$, using polar coordinates.
2. Evaluate $\int_{-1}^{1}\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} \sin(x^2+y^2)\,dy\,dx$ by converting to polar coordinates.
3. Evaluate $\iiint_W (x^2+y^2+z^2)^{5/2}\,dV$, where W is the ball $x^2+y^2+z^2 \leq 1$.
4. Evaluate $\iiint_W \frac{1}{(x^2+y^2+z^2)^{3/2}}\,dV$, where W is the solid bounded by the spheres $x^2+y^2+z^2=a^2$ and $x^2+y^2+z^2=b^2$, where $a, b > 0$.
5. Find the volume of the region enclosed by the cones $z = \sqrt{x^2+y^2}$ and $z = 1 - 2\sqrt{x^2+y^2}$.
6. Find the average of $f(x,y) = e^{x+y}$ over the triangle D with vertices at $(0,0)$, $(0,1)$, and $(1,0)$.