Math 2415 – Calculus III

Assignment

Professor: Fred Khoury

***Directions*:** Show your work whenever possible: a correct answer is worth 0 point without any supporting work.

1. Evaluate $\int_0^2 \int_0^{4-y^2} y\,dx\,dy$

2. Evaluate $\int_0^1 \int_0^a \frac{1}{\left(1+x^2+y^2\right)^2}\,dy\,dx$

3. Evaluate $\int_1^2 \int_0^{\ln x} x^3 e^y\,dy\,dx$

4. the region bounded by the lines $y=-x-4$, $y=x$, and $y=2x-4$ Use a double integral to compute the area of the region. Make a sketch of the region.

5. Find the volume of the region beneath the surface $z=xy+10$ and above the annular region $R=\{(r,\ \theta):\ 2\le r\le 4,\ 0\le\theta\le 2\pi\}$. (An *annulus* is the region between two concentric circles.)

6. Compute the area, and make a sketch of the region inside both the circles $r=2$ and $r=4\cos\theta$

7. Find the volume