Use the paper provided. Put your name on the front of the first page and the back of the last page. Each problem is worth 10 points. **NO CALCULATORS!**

1. Compute $\int_0^1 \int_{\tan^{-1} y}^{\frac{\pi}{4}} \sec^5 x dx\, dy$.

2. Compute $\int_0^1 \int_x^1 e^{-y^2} dy\, dx$.

3. Compute $\int_1^2 \int_1^x e^x dy\, dx$.

4. Find the volume between $z = 9 - x^2 - y^2$ and $z = x^2 + y^2 - 9$.

5. Set up the integral of the function $f(x, y, z)$ over the pyramid with vertices $(0, 0, 0)$, $(2, 0, 0)$, $(2, 1, 0)$, $(0, 1, 0)$, and $(0, 0, 1)$.