1. (7pts) Find $\iint_D x\,dA$ if D is the region bounded by the curves $y = x^2 - 4x$ and $y = 2x$. Sketch the region of integration.

2. (6pts) Evaluate $\displaystyle\int_0^{2\pi}\int_{y/2}^{\pi} \frac{\sin x}{x}\,dx\,dy$ by changing the order of integration. Sketch the region of integration.

3. (6pts) Set up the iterated triple integral for $\iiint_E f\,dV$ if E is the region in the first octant bounded by the planes $x - y = 0$, $y = 3$ and $2y - z = 0$. Sketch the region of integration.

4. (9pts) Sketch the region of integration and evaluate $\iint_D y\,dA$ if D is the region inside the circle $(x-1)^2 + y^2 = 1$ and between the lines $y = -\sqrt{3}x$ and $y = x$.

5. (6pts) Use either cylindrical or spherical coordinates to set up $\iiint_E x^2 + y^2 \, dV$ where E is the region bounded by the cone $z = \sqrt{x^2 + y^2}$ and the sphere $x^2 + y^2 + z^2 = 9$. Sketch the region of integration. Do not evaluate the integral.

6. (7pts) Sketch the region of integration and give the three integrals that end in $dz\,dx\,dy$, $dy\,dz\,dx$ and $dy\,dx\,dz$ that are equivalent to the integral $\displaystyle\int_0^2 \int_{-\sqrt{4-x^2}}^{\sqrt{4-x^2}} \int_0^{3x} f \, dz\,dy\,dx$.

7. (9pts) Use change of variables to evaluate the integral $\iint_D \frac{1}{x}\, dA$ if D is the region bounded by $y = x$, $y = 3x$, $y = 2 - x$ and $y = 5 - x$. Sketch the region D.

Bonus. (5pts) Write the remaining two integrals that are equivalent to the integral in problem 6.