Problem Set 3 Calculus 2 Due 1/11/2005

You are encouraged to work in groups of two to four on this assignment and make a single group submission. Each problem is worth 5 points. For full credit indicate clearly how you reached your answer. All work must be legible and submitted on clean paper without ragged edges.

1. Set up an integral for the area of a triangle with vertices at the origin, the point (a, 0), and the point (c, d), and evaluate it.

2. If a circle of radius r is cut by a line which at its closest is d units from the center of the circle, set up an integral for the area of the smaller piece cut from the circle, and evaluate it.

3. A *torus* is formed by revolving the region bounded by a circle of radius 1 (centered at the origin) around the line $x = 2$. Find the volume of the torus.

4. The surface formed by taking the portion of the curve $y = 1/x$ to the right of $x = 1$ and revolving it around the x-axis is known as *Gabriel's Horn*. Find the volume of Gabriel's Horn.