Problem Set 2 **Calculus 2** **Due 2/17/09**

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. A gas tank shaped like a cylinder lying on its side has a diameter of 6 feet and is 10 feet long. If the cylinder is full of gasoline (which has a density of 42 lbs/ft^3), how much work is required to pump all of the gasoline to a point 6 feet above the top of the tank?

2. A torus is the solid created when a circle is rotated around an axis outside the circle (so the shape of a donut, or an inner tube). Suppose a torus is formed by rotating the circle $(x - 3)^2 + y^2 = 1$ around the y-axis (where the scale is in feet), and that the circle is filled with water (which weighs 62.5 lbs per ft^3). Find the amount of work required to pump all of the water out of the top of the torus.