Math 2425 **Fall 2009**

Problem-solving Activity 9

Your final exam is on Saturday, December 5 from 3 to 5:30 pm.

1. Find the volumes of the following solids using the methods of calculus:
   (a) a ball of radius r
   (b) a right cone of radius r and height $\frac{2}{5}r$
   (c) a right circular cylinder of radius r and height $3r$

2. Find the volume of the solid left after a sphere of radius 2 has a hole of radius $\frac{1}{2}$ drilled through the center.

3. Gloria and Fred are working out at the Activities Center where the dumbbells were constructed as follows: two iron balls of radius 2 inches have a hole of 1 inch in diameter drilled through the center. These two iron balls are connected by an iron bar of length 12 inches. Find the volume of iron needed to make these dumbbells.