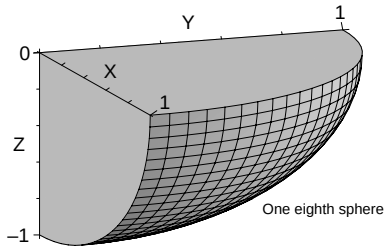
MAC 2313 Cal3 **Quiz 7** 18 Mar 2003 **Name:** _____

Show **ALL** work for credit; be neat. Calculators can be used for graphing and calculating only. Give exact answers when possible.

1. For the region W below write but do not evaluate the triple integral for $\iiint_W f \; dV$ in the following coordinate systems (a) Cartesian (b) Cylindrical (c) Spherical.



2. In this problem we will find the center of mass of a hemisphere with radius R and uniform density k. We map the hemisphere as the volume above $z = 0$ and below $x^2 + y^2 + z^2 = R^2$. From symmetry, $\bar{x} = \bar{y} = 0$; from geometry, the mass is $2\pi k R^3/3$. Find $\bar{z}$. [Choose your coordinate system wisely.] [As a check note that your answer must be of the form αR for some number $0 < \alpha < 1$ to be correct.]