## Worksheet January 24

1. Change $(1, \sqrt{3}, 2 \sqrt{3})$ from rectangular to spherical coordinates.
2. Give inequalities in polar coordinates to describe the solid region lying outside the double cone $z^{2}=x^{2}+y^{2}$ and inside the sphere $x^{2}+y^{2}+z^{2}=4$.
3. A lamina occupies the part of the disk $x^{2}+y^{2} \leq 1$ in the first quadrant. The density at any point is proportional to the distance from the $x$-axis.
(a) Find the total mass. (Your answer will involve the constant of proportionality.)
(b) Find the $x$-coordinate of the center of mass.
