Supplementary Exercises for Section 11.6

1. Plot the polar equations $r = \sin(\theta)$ and $r = \cos(\theta)$ and comment on their similarities. (If you get stuck on how to plot these, you can multiply both sides of each equation by r and convert back to rectangular coordinates).

2. Extend Exercises 11.6.6 and 11.6.11 by rotating the curve $z = mx$ around the z axis and converting to both cylindrical and spherical coordinates.

3. Convert the spherical formula $\rho = \sin\theta \sin\phi$ to rectangular coordinates and describe the surface defined by the formula (Hint: Multiply both sides by ρ)

4. We can describe points in the first octant by $x > 0$, $y > 0$ and $z > 0$. Give similar inequalities for the first octant in cylindrical and spherical coordinates.