Assignment 6

1. Find the area of the given region analytically.
   (a) Common interior of $r = 4\sin\theta$ and $r = 2$
   (b) Interior of $r = 1 - \cos\theta$
   (c) Inner loop of $r = 2 - 4\cos\theta$

2. Convert the point from rectangular coordinates to spherical coordinates.

$$(-5, -5, \sqrt{2})$$

3. Find an equation in spherical coordinates for the surface represented by the rectangular equation.

$$x^2 + y^2 - 3z^2 = 0$$

4. Convert the point from spherical coordinates to cylindrical coordinates.

$$\left(10, \frac{\pi}{6}, \frac{\pi}{2}\right)$$