Quiz #18 (Angular Momentum)

Prob.1(2)

Assume the moon has mass M and is rotating the earth in a circle having radius R on the x-y plane with speed V. Determine the angular momentum of the moon.

Prob.2(2)

Determine $\left[\hat{L}_x, \hat{L}_x + \hat{L}_y \right]$, where $\hat{L}_x$ and $\hat{L}_y$ is x-component and y-component angular momentum operator, respectively. Your answer should be an expression involving x,y,z, $\frac{\partial}{\partial x}, \frac{\partial}{\partial y}, \frac{\partial}{\partial z}$ and fundamental constants.

Prob.3(2)

Show that for any quantum mechanical particle its z-component of the angular momentum in the spherical coordinate has to be integer multiples of $\hbar$.