1. Find the commutators:
   a) $[\hat{L}_x, x]$, b) $[\hat{L}_x, y]$, c) $[\hat{L}_x, z]$.

2. Find the commutators:
   a) $[\hat{L}_x, \hat{p}_x]$, b) $[\hat{L}_x, \hat{p}_y]$, c) $[\hat{L}_x, \hat{p}_z]$.

3. Calculate the following commutators:
   a) $[\hat{L}_x, \hat{\mathbf{r}}^2]$, b) $[\hat{L}_x, \hat{\mathbf{p}}^2]$.

4. Show that $\hat{\mathbf{L}}^2 = \hat{L}_- \hat{L}_+ + \hbar \hat{L}_z + \hat{L}_z^2$.