Quantum Physics II - Homework 6

Suppose we measure the L^2 value of a particle obtaining the result $30\hbar^2$.

a) If just after, we measure the L_z component of the angular momentum, what are the possible outcomes?

b) If the result obtained is $4\hbar$, what is the dependence of the wavefunction of the parcicle on the azimuth angle φ?

c) If we apply the $\hat{L}_+$ operator, what is the resulting state?

d) What happens if the $\hat{L}_+$ operator is applied again? Is the result obtained logical? Why?