

Physics 4410
Quantum Mechanics 2

Lecture 16

Angular momentum algebra

October 5, 2020

1. Review the angular momentum algebra.

2. Define raising and lowering operators

$$J_{\pm} = J_x \pm iJ_y.$$

3. Show that there must exist states annihilated by J_{\pm} .

4. Find all eigenvalues and eigenvectors of \mathbf{J}^2 and J_z .

5. Evaluate $J_{\pm}|jm\rangle$.

Activity: Construct the three angular momentum matrices J_x , J_y and J_z for total spin $j = 1$.