

1 Spin One Eigenvectors

The operator \hat{S}_x for spin-1 (in the z -basis) may be written as:

$$\hat{S}_x = \frac{\hbar}{\sqrt{2}} \begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$$

- (a) Find the eigenvalues of this matrix.
- (b) Find the (un-normalized) eigenvectors of this matrix. Write the eigenvectors as both matrices and kets.