

$$[N, A^\dagger] = A^\dagger,$$

$$[N, A] = -A,$$

$$AA^\dagger = (N - l_1)(N - l_2)(N + l_1 + 1)(N + l_2 + 1),$$

$$A^\dagger A = (N - l_1 - 1)(N - l_2 - 1)(N + l_1)(N + l_2).$$