Assignment 5

1. Consider the state described by the superposition: $|\psi\rangle = |\alpha\rangle + |\beta\rangle$. You are asked to show that this state is always normalized when $|\alpha|^2 + |\beta|^2 = 1.$

2. Consider the state described by the superposition: $|\psi\rangle = |\alpha\rangle + i|\beta\rangle$. You are asked to show that this state is always normalized when $|\alpha|^2 + |\beta|^2 = 1$.

3. Consider the state described by the superposition: $|\psi\rangle = |\alpha\rangle + \sqrt{0.5}|\beta\rangle$. You are asked to show that this state is always normalized when $|\alpha|^2 + |\beta|^2 = 1$.