Consider a spin-1/2 system system prepared in the state:

$$|\psi_{in}\rangle = \frac{2}{3}|+\rangle + \frac{\sqrt{5}}{3}|-\rangle$$

What is the probability that when you measure the z-component of spin angular momentum you'll get $\frac{\hbar}{2}$? $-\frac{\hbar}{2}$?

Consider a spin-1/2 system system prepared in the state:

$$|\psi_{in}\rangle = \frac{\sqrt{3}}{2}|+\rangle + \frac{i}{2}|-\rangle$$

What is the probability that when you measure the z-component of spin angular momentum you'll get $\frac{\hbar}{2}$? $-\frac{\hbar}{2}$?

Consider a spin-1/2 system system prepared in the state:

$$|\psi_{in}\rangle = ae^{i\alpha}\,|+\rangle + be^{i\beta}\,|-\rangle$$

What is the probability that when you measure the z-component of spin angular momentum you'll get $\frac{\hbar}{2}$? $-\frac{\hbar}{2}$?