True or False: In the quantum state $\alpha|0\rangle + \beta|1\rangle$, $|\alpha|^2 + |\beta|^2$ is equal to 1.

A quantum state is represented in bra-ket notation as $\alpha|0\rangle + \beta|1\rangle$.

What is the probability that the measurement will be $|0\rangle$?

a. b.

α β

 $|\alpha|^2$ $|\beta|^2$

C.

What is the probability that the measurement will be $|1\rangle$? α

a. b.

3.

β

 $|\alpha|^2$ C. $|\beta|^2$

Assign values to α and β in the quantum state $\alpha|0\rangle + \beta|1\rangle$ such that it is more likely that a $|1\rangle$ will be measured than $|0\rangle$. α = 0.6 and β = 0.8 a. $\alpha = 0.8$ and $\beta = 0.6$

 α = 0.4 and β = 0.6

 α = 0.6 and β = 0.4

5. What is bra-ket notation for a black ball? (choose all that apply)

- a. |0>
- b. |1>
- c. 0|0> + 1|1>
- d. 1|0> + 0|1>

6. What is bra-ket notation for a white ball? (choose all that apply)

- a. |0>
- b. |1>
- c. 0|0> + 1|1>
- d. 1|0> + 0|1>

7. If the qubit state is $0.8|0\rangle + 0.6|1\rangle$, what is the probability that the measurement will be $|0\rangle$?

- a. 0.36
- b. 0.6
- c. 0.64
- d. 0.8