

1. A quantum system with exactly two discrete eigenstate
2. Vectors that points to the surface of sphere
3. True
4. σ_y
5. σ_z
6. $|+\rangle$ and $|-\rangle$
7. $\frac{1}{\sqrt{3}}$ and $\sqrt{\frac{2}{3}}$
8. $e^{i\frac{\pi}{3}}$
9. $e^{i\frac{\pi}{6}}$
10. none of the above
11. Global phase
12. $|0\rangle$
13. $\frac{1}{\sqrt{2}}(|0\rangle + i|1\rangle)$
14. $\cos\left(\frac{3\pi}{8}\right)|0\rangle + e^{-i\frac{\pi}{4}}\sin\left(\frac{3\pi}{8}\right)|1\rangle$
15. $\cos\left(\frac{\pi}{3}\right)|0\rangle + e^{-i\frac{\pi}{4}}\sin\left(\frac{3\pi}{8}\right)|1\rangle$

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