## FUN WITH PHASE

(True / False) Phase is associated with a two-bit pair.

(True /False) Multi-bit operations can be solved neatly with visual representation.

(True / False) When the Z gate is applied, the probability of measuring  $|0\rangle$  or  $|1\rangle$  does not change.

Which matrix corresponds with the Z gate as defined?

$$\begin{array}{c|ccccc}
a. & \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix} & \begin{bmatrix} b & \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} & \begin{bmatrix} c. & \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix} & \begin{bmatrix} d. & \begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \\
\end{array}$$

$$\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$$

$$\begin{array}{c|c}
c. & 0 & 1 \\
-1 & 0
\end{array}$$

$$\begin{array}{c|c}
d. & -1 & 0 \\
0 & 1
\end{array}$$

For this C-Z (Controlled-Z) gate, which of the following are possible correct start and end states? (choose all that apply)





