



$$\text{SWAP} = \begin{pmatrix} 0 & 0 \\ 0 & 1 \\ 1 & 0 \\ 0 & 0 \\ 0 & 1 \end{pmatrix} = \begin{array}{|c|} \hline \text{[Circuit Diagram: A square box containing two crossing lines, representing a swap operation.] \\ \hline \end{array}.$$

$$U_k = \begin{pmatrix} e^{2\pi 2^{-k}} & 0 \\ 0 & e^{-2\pi 2^{-k}} \end{pmatrix}$$

$$A=\int d\Theta\,1rr^2\sin(\theta)$$

$$\mathcal{L}G\left(\mathbf{x},\xi\right)+\delta\left(\mathbf{x}-\xi\right)=0\quad \mathbf{x},\xi\in\mathbb{R}^n$$

$$R_k = \begin{pmatrix} 1 & 0 \\ 0 & e^{2\pi i 2^{-k}} \end{pmatrix} \rightarrow \begin{pmatrix} 1 & 0 \\ 0 & e^{2\pi i (2^{-k} + \phi)} \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & e^{2\pi i 2^{-k}} \end{pmatrix} \begin{pmatrix} 1 & \\ 0 & e^{i\phi} \end{pmatrix} = R_k L_\phi = R_\phi R_k$$