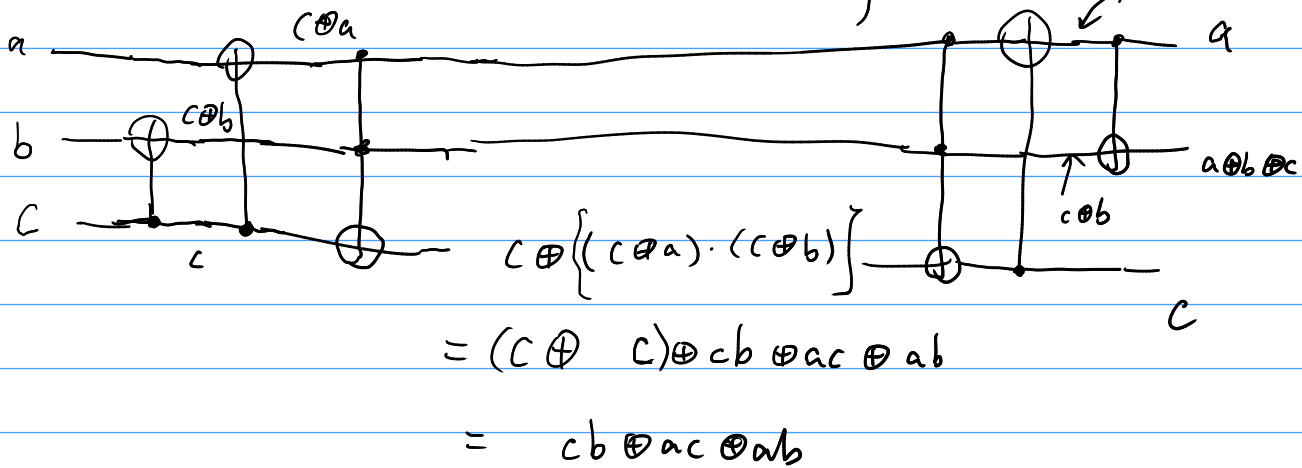


maj - circuit.



^  
numaj.

\* QFT (Quantum Fourier Transform)

$$qft |a\rangle = \frac{1}{\sqrt{2^n}} \sum_k^{N-1} e^{2\pi i \frac{a \cdot k}{2^n}} |k\rangle$$

$a \in \{0, \dots, N\}$ .  $N = 2^n$

a is a n-bit binary.

- e.g
- $|0\rangle = |000\rangle$
  - $|1\rangle = |001\rangle$
  - $|2\rangle = |010\rangle$
  - $\vdots$
  - $|7\rangle = |111\rangle$

① qft is unitary.