Definition (Compact closed category). Let $\langle \mathbf{C}, \otimes, I, \sigma \rangle$ be a symmetric monoidal category. It is called *compact closed* if, for all $C \in \mathbf{C}$ there exists some object $C^* \in \mathbf{C}$ (called the *dual of* C), a morphism $\eta_C : I \to C^* \otimes C$ (called the *unit for* C), and a morphism $\epsilon_C : C \otimes C^* \to I$ (called the *counit of* C) such that the following diagrams commute for all $C \in \mathbf{C}$:

$$\begin{tikzcd}
C \arrow[rrr, equal] \arrow[d, "\rho^{-1}"'] & & & C \\
C \otimes I \arrow[r, "\eta"'] & C \otimes (C^* \otimes C) \arrow[r, "\alpha"'] & (C \otimes C^*) \otimes C \arrow[r, "\epsilon"'] & I \otimes C \arrow[u, "\lambda"']
\end{tikzcd}$$

$$\begin{tikzcd}
C^* \arrow[rrr, equal] \arrow[d, "\lambda^{-1}"'] & & & C^* \\
I \otimes C^* \arrow[r, "\eta"'] & (C^* \otimes C) \otimes C^* \arrow[r, "\alpha"'] & C \otimes (C \otimes C^*) \arrow[r, "\epsilon"'] & C^* \otimes I \arrow[u, "\rho"']
\end{tikzcd}$$