Definition (Dualizable object). Let $\langle \mathbf{C}, \otimes_{\mathbf{C}}, \mathbf{1}_{\mathbf{C}}, \mathrm{br} \rangle$ be a monoidal category, and let $X \in \mathrm{Ob}_{\mathbf{C}}$. A *right dual object* of X is specified by:

Constituents

1. an object $X^\vee \in \mathrm{Ob}_{\mathbf{C}}$;
2. an evaluation map $\epsilon_X : X^\vee \otimes X \to \mathbf{1}$;
3. a coevaluation map $\eta_X : \mathbf{1} \to X \otimes X^\vee$;

Conditions

1. $(\eta_X \otimes \mathrm{Id}_X) \fatsemi (\mathrm{Id}_X \otimes \epsilon_X) = \mathrm{Id}_X$;
2. $(\mathrm{Id}_{X^*} \otimes \eta_X) \fatsemi (\epsilon_X \otimes \mathrm{Id}_{X^*}) = \mathrm{Id}_{X^*}$