Why

We can abstract the property of self-adjointness.

Definition

An operator T oon an inner product space is called *normal* if if commutes with its adjoints. In symbols, $T \in \mathcal{L}(V)$ is normal if

$$TT^* = T^*T$$

Proposition 1. *Every self-adjoint operator is normal.*

Proof. Suppose $T \in \mathcal{L}(V)$ with $T^* = T$. Then $TT^* = TT = T^*T$, and so T is normal. $\square$