numberical range. This covers the rest of the continuous and residual
or \( x - \langle x, x \rangle \mathbf{T} = (\mathbf{T} - \mathbf{T}^*) x \)
\( \langle x, x \rangle \mathbf{T} - \langle x, x \rangle \mathbf{T}^* = \langle x, x \rangle (\mathbf{T} - \mathbf{T}^*) \)

by Theorem 4.2.6(b). Then \( \mathbf{T}^* \mathbf{T} \) is the null space of \( \mathbf{T} \) and there is \( x \in \mathcal{V} \) such that \( \mathbf{T} \mathbf{x} = 0 \), which says for \( \mathbf{T} \mathbf{x} = 0 \) where
If \( \mathbf{T} \mathbf{x} \) is not bounded below the closure of the numerical range in the
the continuous spectrum and part of the residual spectrum
this case that \( \mathbf{T} \mathbf{x} \) is not bounded below. This potentially includes part of
Proposition 8.17. For \( H \) a Hilbert space and \( \mathbf{T} \in \mathcal{B}(H) \), then \( \mathbf{T} \mathbf{x} : \mathcal{V} \subset \mathcal{V} \).