Theorem 6.5(c)

\[(\forall x)(x \in \mathbb{F})\]

... 

Proof of (b):

For all \( x \in \mathbb{F} \) and \( f \in \mathbb{F} \), then for all \( x \in \mathbb{F} \).

\[(\forall x)(\forall f)(x \in \mathbb{F}) \land (f \in \mathbb{F}) \rightarrow (f \in \mathbb{F}) \land (x \in \mathbb{F}) \]

We have

... 

Setting:

Theorem 6.6. Properties of the Adjoints in the Normed Linear Space

\[(\forall x)(x \in \mathbb{F})\]

... 

Proof of (a):

For all \( x \in \mathbb{F} \).

\[(\forall x)(\forall y)(x \in \mathbb{F}) \land (y \in \mathbb{F}) \rightarrow (y \in \mathbb{F}) \land (x \in \mathbb{F}) \]

We have

... 

Setting:

Theorem 6.6. Properties of the Adjoints in the Normed Linear Space
\[ \| T^* \| = \| T \|, \text{ for all } T. \]

Therefore, \( \| T \| \leq \| T^* \| \). Since \( \epsilon > 0 \) is arbitrary, this implies that

\[ \| T \| \leq \| T^* \| - \epsilon, \quad \text{for all unit vectors } x \in \mathcal{X}. \]

Taking a supremum over all unit vectors gives

\[ \| T \| \leq \| T^* \| - \epsilon. \]

So, taking a supremum over all such \( \epsilon > 0 \), we have \( \| T \| \leq \| T^* \| \).

**Proof of (p) continued.**

For all \( f \in X \), \( \| f \| \leq \| T \| \| f \| \). Since \( X \) is a normed linear space, by the definition of norm of functional \( f \),

\[ \| f \| \leq \| f \| \| T \| \| f \|. \]

By the definition of norm of functional \( f \),

\[ \| x \| = \| f \| \| T \| \| f \|. \]

Thus, for all \( f \in X \), \( \| f \| \leq \| T \| \| f \|. \)

Thus, for all \( f \in X \), \( \| f \| \leq \| T \| \| f \|. \)

**Proof of (p).**

For all \( f \in X \), \( \| f \| \leq \| T \| \| f \|. \)

Then for any unit vectors \( f \in X \) and \( x \in \mathcal{X} \), we have

\[ \| f \| \leq \| T \| \| f \|. \]

Thus, for all \( f \in X \), \( \| f \| \leq \| T \| \| f \|. \)

Thus, for all \( f \in X \), \( \| f \| \leq \| T \| \| f \|. \)

**Theorem 5.6.** Properties of Adjoint in Normed Linear Space Setting.