TALLER 9 (Parte 2)

HT5 - 1

$L = \frac{d}{dx}\left[p\frac{d}{dx}\right] + q$; $\underbrace{uLv} - vLu = [p(uv' - vu')]$

$u\left[p'v' + pv'' + \underline{qv}\right] - v\left[p'u' + pu'' + \underline{qv}\right]$

Espectro de T es $\{\lambda_i\} \,|\, (T - \lambda_i I)$ sh no invertible.

$A, B \to [A,B] = AB - BA$

$[A,B] = 0 \quad \to [A, A^{+}] = AA^{+} - A^{+}A = 0$

HT4 - 2

$\|A\| \geq M$ y $\|A\| \leq M$

$M := \sup_{\{\|x\| = \|y\| = 1\}} |\langle y, Ax\rangle|$

por cauchy-Schwarz.

$|\langle y, Ax\rangle| \leq \underbrace{\cancel{\|y\|}}_{1} \|Ax\| \leq \|A\| \cdot \underbrace{\cancel{\|x\|}}_{1} = \|A\|$

$M \le \|A\|$

$$\left\{ y = \frac{Ax}{\|Ax\|} \rightarrow \underbrace{|\langle y, Ax\rangle|} = \left|\left\langle \frac{Ax}{\|Ax\|}, Ax \right\rangle\right| = \|Ax\| \le M \right.$$

$$\sup_{\{\|x\|=1\}} \|Ax\| \le M$$

$$= \boxed{\|A\|}$$

$\Rightarrow$ Lema 1.5

$\begin{pmatrix} a & b \\ c & d \end{pmatrix}$

$M = \|A\|$ Falomir.

$$\overset{\shortparallel}{A} \rightarrow A^t = \begin{pmatrix} a & c \\ b & d \end{pmatrix} \rightarrow \text{transpuesta}$$

$$A \rightarrow A^* = \begin{pmatrix} \bar{a} & \bar{b} \\ \bar{c} & \bar{d} \end{pmatrix} \rightarrow \text{conjugada}$$

$$A \rightarrow A^\dagger = \begin{pmatrix} \bar{a} & \bar{c} \\ \bar{b} & \bar{d} \end{pmatrix} \rightarrow \text{transpuesta conjugada}$$

$\overset{\shortparallel}{A^*}$

d

adjunta.