$$\text{ʇ:⧗}\in \overset{2}{\underset{0}{\triangleleft}}\mathbb{K}\ \text{HilbR} \Leftrightarrow \begin{cases} \text{˥}\overset{*}{\text{⧗}}\text{ꟻ} = \text{ꟻ⧗˥} \\ \text{˥⧗˥} \geqslant 0 \\ \text{˥⧗˥} = 0 \quad \underset{\text{treu}}{\Rightarrow} \text{˥} = 0 \end{cases}$$

$$\text{ʇ}^{\perp} = \frac{\text{ɿ} \in \text{ʇ}}{\text{ʇ⧗ɿ} = 0\text{:} \bigwedge_{\text{˥}}^{\text{ʇ}} \text{ʇ⧗ɿ} = 0}\ \text{radical}$$

$$\text{ɿ⧗ɿ} = 0 \Rightarrow \text{ʇ⧗ɿ} = 0$$

$$\mathbb{R} \ni t \underset{\text{diff}}{\mapsto} {}^{t}\text{ɩ} = \text{ɿ}+t\text{˥}\,\text{⧗}\,\text{ɿ}+t\text{˥} = \text{ɿ⧗ɿ} + t\,\text{˥⧗ɿ}+\text{ɿ⧗˥} + t^2\,\text{˥⧗˥} \geqslant 0 = \text{ɿ⧗ɿ} = {}^{0}\text{ɩ}\ \min$$

$$\Rightarrow 0 = {}^{0}\underline{\text{ɩ}} = \text{˥⧗ɿ} + \text{ɿ⧗˥} = 2\Re\,\text{˥⧗ɿ}$$

$$\begin{cases} \mathbb{K} = \mathbb{R} \\ \mathbb{K} = \mathbb{C} \quad \Rightarrow \mathcal{I}\,\text{˥⧗ɿ} = \Re\,\text{˥}i\text{⧗ɿ} = 0 \end{cases} \Rightarrow \text{˥⧗ɿ} = 0$$

$$\text{˥⧗ꟻ}\,\text{ꟻ⧗˥} \leqslant \text{˥⧗˥}\,\text{ꟻ⧗ꟻ}$$

$$\text{˥⧗ꟻ}\,\text{ꟻ⧗˥} = \text{˥⧗˥}\,\text{ꟻ⧗ꟻ} \underset{\text{treu}}{\Rightarrow} \text{˥: ꟻ}\ \text{lin abh}$$

$$\text{ꟻ⧗ꟻ} = 0 \underset{\text{Lem}}{\Rightarrow} \text{˥⧗ꟻ} = 0 = \text{ꟻ⧗˥}$$

$$\text{ꟻ⧗ꟻ} > 0 \Rightarrow 0 \leqslant \overbrace{\text{˥}\,\text{ꟻ⧗ꟻ} - \text{ꟻ}\,\text{ꟻ⧗˥}}\,\text{⧗}\,\overbrace{\text{˥}\,\text{ꟻ⧗ꟻ} - \text{ꟻ}\,\text{ꟻ⧗˥}}$$

$$= \text{ꟻ⧗ꟻ}\,\text{˥⧗˥}\,\text{ꟻ⧗ꟻ} - \text{ꟻ}\overset{*}{\text{⧗}}\text{˥}\,\text{ꟻ⧗˥}\,\text{ꟻ⧗ꟻ} - \text{ꟻ⧗ꟻ}\,\text{˥⧗ꟻ}\,\text{ꟻ⧗˥} + \text{ꟻ}\overset{*}{\text{⧗}}\text{˥}\,\text{ꟻ⧗ꟻ}\,\text{ꟻ⧗˥}$$

$$= \underset{>0}{\text{ꟻ⧗ꟻ}}\,\overbrace{\text{˥⧗˥}\,\text{ꟻ⧗ꟻ} - \text{˥⧗ꟻ}\,\text{ꟻ⧗˥}} \Rightarrow \text{˥⧗˥}\,\text{ꟻ⧗ꟻ} - \text{˥⧗ꟻ}\,\text{ꟻ⧗˥} \geqslant 0$$

$$\text{˥⧗ꟻ}\,\text{ꟻ⧗˥} = \text{˥⧗˥}\,\text{ꟻ⧗ꟻ} = 0 \Rightarrow \overbrace{\text{˥}\,\text{ꟻ⧗ꟻ} - \text{ꟻ}\,\text{ꟻ⧗˥}}\,\text{⧗}\,\overbrace{\text{˥}\,\text{ꟻ⧗ꟻ} - \text{ꟻ}\,\text{ꟻ⧗˥}} = 0 \underset{\text{treu}}{\Rightarrow} \text{˥}\,\text{ꟻ⧗ꟻ} - \text{ꟻ}\,\text{ꟻ⧗˥} = 0$$

$$\overline{\text{˥⧗ꟻ}} \leqslant \text{"˥"}\text{"ꟻ"}$$

$$\|\urcorner\| = \overbrace{\urcorner\bowtie\urcorner}^{1/2} \quad \text{halbnorm}$$

$$\bowtie \text{ treu} \Rightarrow \text{norm}$$

$$\overbrace{\|\urcorner\|+\|\ddagger\|}^{2} - \|\urcorner+\ddagger\|^{2} = 2\underbrace{\|\urcorner\|\|\ddagger\| - \Re\,\urcorner\bowtie\ddagger} \geqslant 2\underbrace{\|\urcorner\|\|\ddagger\| - |\urcorner\bowtie\ddagger|} \geqslant 0$$

$$\|\urcorner\alpha\|^{2} = \underbrace{\urcorner\alpha}\bowtie\underbrace{\urcorner\alpha} = \overset{*}{\alpha}\underbrace{\urcorner\bowtie\urcorner}_{\in\mathbb{R}}\alpha = \underbrace{\urcorner\bowtie\urcorner}\underbrace{\overset{*}{\alpha}\alpha} = \|\urcorner\|^{2}|\alpha|^{2}$$

$$\|\urcorner+\ddagger\|^{2} + \|\urcorner-\ddagger\|^{2} = 2\underbrace{\|\urcorner\|^{2}+\|\ddagger\|^{2}}$$

$$\text{LHS} = \urcorner\bowtie\urcorner + \urcorner\bowtie\ddagger + \ddagger\bowtie\urcorner + \ddagger\bowtie\ddagger + \urcorner\bowtie\urcorner - \urcorner\bowtie\ddagger - \ddagger\bowtie\urcorner + \ddagger\bowtie\ddagger = \text{RHS}$$

$$4\urcorner\bowtie\ddagger = \begin{cases} \underbrace{\urcorner+\ddagger}\bowtie\underbrace{\urcorner+\ddagger} - \underbrace{\urcorner-\ddagger}\bowtie\underbrace{\urcorner-\ddagger} & \mathbb{K}=\mathbb{R} \\ \sum_{k}^{4} i^{k}\underbrace{\urcorner i^{k}+\ddagger}\bowtie\underbrace{\urcorner i^{k}+\ddagger} & \mathbb{K}=\mathbb{C} \end{cases}$$

$$\underbrace{\urcorner+\ddagger}\bowtie\underbrace{\urcorner+\ddagger} - \underbrace{\urcorner-\ddagger}\bowtie\underbrace{\urcorner-\ddagger} = 2\urcorner\bowtie\ddagger + 2\,\ddagger\bowtie\urcorner \underset{\text{symm}}{\overset{\mathbb{K}=\mathbb{R}}{=}} 4\urcorner\bowtie\ddagger$$

$$\sum_{k}^{4} i^{k}\underbrace{\urcorner i^{k}+\ddagger}\bowtie\underbrace{\urcorner i^{k}+\ddagger} = \sum_{k}^{4} i^{k}\overbrace{\urcorner\bowtie\urcorner + \underbrace{\ddagger\bowtie\urcorner}i^{k} + i^{-k}\underbrace{\urcorner\bowtie\ddagger} + \ddagger\bowtie\ddagger}$$

$$= \overbrace{\sum_{k}^{4} i^{k}}^{=0}\underbrace{\urcorner\bowtie\urcorner + \ddagger\bowtie\ddagger} + \overbrace{\sum_{k}^{4} i^{2k}}^{=0}\ddagger\bowtie\urcorner + \sum_{k}^{4}\urcorner\bowtie\ddagger = 4\urcorner\bowtie\ddagger$$