$$ {}^{\hbar}\triangle^{p}_{m}\mathbb{K} = \frac{\hbar \xrightarrow[\text{mes}]{\daleth} \mathbb{K}}{\int_{\mu}^{\hbar} \overline{{}^{\hbar}\daleth}^{\,p} < \infty} \sqsubset {}^{\hbar}\triangle^{p}_{m}\mathbb{K} $$

$$ {}^{\hbar}\triangle^{p}_{m}\beth = {}^{\hbar}\triangle^{p}_{m}\mathbb{K} \bowtie \beth $$

$$ \hbar \xrightarrow[\text{p-int}]{\dot{\daleth}} \beth \Rightarrow \daleth + \acute{\daleth}\ \text{p-int} $$

$$ \overline{{}^{\hbar}\daleth + {}^{\hbar}\acute{\daleth}}^{\,p} \leqslant 2^{p} \underbrace{\overline{{}^{\hbar}\daleth}^{\,p} \curlywedge \overline{{}^{\hbar}\acute{\daleth}}^{\,p}} \leqslant 2^{p} \underbrace{\overline{{}^{\hbar}\daleth}^{\,p} + \overline{{}^{\hbar}\acute{\daleth}}^{\,p}} \Longrightarrow \overline{\daleth + \acute{\daleth}}^{\,p} \leqslant 2^{p} \underbrace{\overline{\daleth}^{\,p} + \overline{\acute{\daleth}}^{\,p}} $$

$$ x{:}y \geqslant 0 \underset{*}{\Longrightarrow} xy \leqslant \frac{x^{p}}{p} + \frac{y^{q}}{q} $$

$$ x^{p} \underset{\text{OE}}{\geqslant} y^{q} \Longrightarrow x \geqslant y^{q/p} $$

$$ (*)\ \text{ for } x = y^{q/p} $$

$$ x \geqslant y^{q/p} \Longrightarrow x^{(p-1)\,q} = x^{p} \geqslant y^{q} \Longrightarrow \frac{d}{dx}\underbrace{xy} = y \leqslant x^{p-1} = \frac{d}{dx}\underbrace{\frac{x^{p}}{p} + \frac{y^{q}}{q}} \underset{\text{MWS}}{\Longrightarrow} (*)\ \text{ for } x \geqslant y^{q/p} $$

$$ {}^{\hbar}\triangle^{p}_{m}\acute{\mathbb{1}} \bowtie {}^{\hbar}\triangle^{q}_{m}\acute{\acute{\mathbb{1}}} \xrightarrow[\text{contr}]{\overset{\infty}{\times}} {}^{\hbar}\triangle^{1}_{m}\mathbb{1} \xrightarrow{\text{tr}} {}^{\hbar}\triangle^{1}_{m}\mathbb{K} \xrightarrow{\int_{\mu}^{\hbar}} \mathbb{K} $$

$$ \overline{\daleth \overset{\oplus}{\times} \acute{\daleth}} \leqslant \overline{\daleth}\,\overline{\daleth} $$

$$ {}^{\hbar}\triangle^{p}_{m}\acute{\mathbb{1}} \bowtie {}^{\hbar}\triangle^{q}_{m}\acute{\acute{\mathbb{1}}} \xrightarrow[\text{contr}]{\overset{\infty}{\times}} {}^{\hbar}\triangle^{r}_{m}\mathbb{K} $$

$$\overline{f \overset{\oplus}{\times} g} \leqslant \|f\|\|g\|$$

$$\int_{\mu}^{\hbar} \frac{\overline{\hbar f \times \hbar g}}{\|f\|\|g\|} \leqslant \int_{\mu}^{\hbar} \frac{\overline{\hbar f}}{\|f\|}\frac{\overline{\hbar g}}{\|g\|} \leqslant \frac{1}{p}\int_{\mu}^{\hbar} \frac{\overline{\hbar f}^{p}}{\|f\|^{p}} + \frac{1}{q}\int_{\mu}^{\hbar} \frac{\overline{\hbar g}^{q}}{\|g\|^{q}} = \frac{1}{p} + \frac{1}{q} = 1$$

$$\|f \times g\|^{r} = \int_{\mu}^{\hbar} \overline{\hbar f \times \hbar g}^{r} \leqslant \int_{\mu}^{\hbar} \overline{\hbar f}^{r} \, \overline{\hbar g}^{r} \leqslant \underbrace{\int_{\mu}^{\hbar} \overline{\hbar f}^{r \cdot p/r}}_{r/p} \underbrace{\int_{\mu}^{\hbar} \overline{\hbar g}^{r \cdot q/r}}_{r/q} = \|f\|^{r} \, \|g\|^{r}$$

$$\hbar \underset{m}{\overset{p}{\triangle}} \mathbb{K} \xleftarrow[\text{isomet}]{*} \hbar \underset{m}{\overset{p}{\triangle}} \mathbb{K}$$

$$\|f + g\| \leqslant \|f\| + \|g\|$$

$$\|f + g\|^{p} = \int_{\mu}^{\hbar} \overline{\hbar f + \hbar g} \; \overline{\hbar f + \hbar g}^{\,p-1} \leqslant \sum_{\cdot} \int_{\mu}^{\hbar} \overline{\hbar \dot{f}} \; \overline{\hbar f + \hbar g}^{\,p-1} \leqslant \sum_{\cdot} \int_{\mu}^{\hbar} \overline{\hbar \dot{f}}^{\,p^{1/p}} \underbrace{\int_{\mu}^{\hbar} \overline{\hbar f + \hbar g}^{\,(p-1)\,q}}_{1/q} = \underbrace{\|f\| + \|g\|} \, \|f + g\|^{p/q}$$

$$p - p/q = p\,(1 - 1/q) = p1/p = 1 \Rightarrow \|f + g\| = \frac{\|f + g\|^{p}}{\|f + g\|^{p/q}} \leqslant \|f\| + \|g\|$$

$$\begin{cases} \hbar \overset{p}{\underset{m}{\triangle}} \mathbb{K} \text{ voll} \\ \hbar \overset{p}{\underset{m}{\triangle}} \beth \text{ voll} \quad \beth \text{ voll} \end{cases}$$

$$\hbar \overset{p}{\underset{m}{\triangle}} \beth \ni \daleth_n : \quad c = \sum_{0 \leqslant n} \overline{\daleth_n} < \infty$$

$$^{h}\gimel_n := \sum_{i}^{n} \overline{^{h}\daleth_i} \Rightarrow \gimel_n \nearrow \gimel : \hbar \xrightarrow[\text{meas}]{} \bar{\mathbb{R}}_+$$

$$\overline{\gimel_n} \leqslant \sum_i^n \overline{\daleth_i} \leqslant c \Rightarrow s^p \geqslant \int_\mu^\hbar \gimel_n^p \underset{\text{MCT}}{\nearrow} \int_\mu^\hbar \gimel^p \leqslant c^p \Rightarrow \gimel^p \text{ int } \Rightarrow \bigvee_E^{\mathcal{M}} \llcorner_{\hbar \llcorner E} = 0 \bigwedge_h^E {}^{h}\gimel^p < \infty$$

$$\Rightarrow \sum_{i \geqslant 0} \overline{^{h}\daleth_i} = {}^{h}\gimel < \infty \underset{\text{voll}}{\Rightarrow} \bigvee \beth \ni {}^{h}\daleth = \sum_i^{\mathbb{N}} {}^{h}\daleth_i \Rightarrow E \xrightarrow[\text{mb}]{\daleth = \sum_i^{\mathbb{N}} \daleth_i} \beth$$

$$\overline{^{h}\daleth} \leqslant \sum_i^{\mathbb{N}} \overline{^{h}\daleth_i} = {}^{h}\gimel \Rightarrow \text{ int } 2^p\, {}^{h}\gimel^p \geqslant \overbrace{\sum_i^n {}^{h}\daleth_i - {}^{h}\daleth}^{p} \rightsquigarrow 0 \underset{\text{DCT}}{\Rightarrow} \int_\mu^E \overbrace{\sum_i^n {}^{h}\daleth_i - {}^{h}\daleth}^{p} \rightsquigarrow 0 \Rightarrow \sum_i^n \daleth_i \underset{p}{\rightsquigarrow} \daleth$$

$$\hbar \overset{0}{\underset{c}{\triangle}} \mathbb{R} \underset{\text{hull}}{\sqsubset} \hbar \overset{p}{\underset{m}{\triangle}} \mathbb{R} \underset{\text{hull}}{\sqsupset} \hbar \overset{p:\infty}{\underset{m}{\triangle}} \mathbb{R}$$

$$\hbar \overset{p}{\underset{m}{\triangle}} \mathbb{R} \ni \daleth = \daleth_- - \daleth_+$$

$$\daleth_1 \in \hbar \overset{p}{\underset{m}{\triangle}} \mathbb{R} \underset{\text{OE}}{\Rightarrow} \daleth \geqslant 0 \Rightarrow \bigvee 0 \leqslant \varphi_n \nearrow \daleth \nwarrow \acute{\varphi}_n \geqslant 0$$

$$\dot{\varphi} \leqslant \daleth^p \text{ int } \Rightarrow \begin{cases} \varphi_n \llcorner \text{ fin supp} \\ \acute{\varphi}_n \text{ p-int} \end{cases}$$

$$0 \leftsquigarrow \overbrace{\daleth - \dot{\varphi}_n}^{p} \leqslant \daleth^p \underset{\text{DCT}}{\Rightarrow} \overline{\daleth - \dot{\varphi}_n}^{p} = \int_\mu^\hbar \overbrace{\daleth - \dot{\varphi}_n}^{p} \rightsquigarrow 0$$