$$r < R \Longrightarrow \sum_{n}^{\mathbb{N}} \overline{\frac{p}{q}(n)\, a_n}\, r^n < +\infty$$

$$\bigvee r < \varrho < R$$

$$\frac{r}{\varrho} < 1 \overset{\text{Quot}}{\Longrightarrow} \sum_{n}^{\mathbb{N}} \frac{p}{q}(n) \left(\frac{r}{\varrho}\right)^n < +\infty \Longrightarrow \frac{p}{q}(n) \left(\frac{r}{\varrho}\right)^n \rightsquigarrow 0 \Longrightarrow \frac{p}{q}(n)\, r^n = \underbrace{\frac{p}{q}(n) \left(\frac{r}{\varrho}\right)^n}_{\leqslant M} \varrho^n \leqslant M\, \varrho^n$$

$$\Longrightarrow \sum_{n}^{\mathbb{N}} \overline{\frac{p}{q}(n)\, a_n}\, r^n \leqslant M \sum_{n} \overline{a_n}\, \varrho^n < +\infty$$

$$\sum_{n}^{\mathbb{N}} \frac{p}{q}(n)\, a_n\, x^n \ \text{Konv-Rad}\ R$$

$$ {}^{x}\text{ɿ} = \sum_{n}^{\mathbb{N}} a_n\, x^n \ \text{diff} \implies \text{stet}\ \overline{x} < R $$

$$ {}^{x}\underline{\text{ɿ}} = \sum_{n}^{\mathbb{N}} (n+1)\ a_{n+1}\, x^n $$

$$ \overline{x} \leqslant r \geqslant \overline{o} \implies \overline{\frac{x^{n+1} - o^{n+1}}{x-o} - (n+1)\, o^n} \leqslant \overline{x-o}\, \frac{n\,(n+1)}{2}\, r^{n-1} $$

$$ \underbrace{x-o}\,\underbrace{x^{n-1} + 2x^{n-2}o + 3x^{n-3}o^2 + \cdot\cdot + no^{n-1}} $$

$$ = x^n + 2\,x^{n-1}o + 3\,x^{n-2}\,o^2 + \cdot\cdot + nx\,o^{n-1} - x^{n-1}o - 2\,x^{n-2}\,o^2 - \cdot\cdot - (n-1)\,x\,o^{n-1} - n\,o^n $$

$$ = x^n + x^{n-1}o + x^{n-2}\,o^2 \cdot\cdot + x\,o^{n-1} - n\,o^n = x^n + x^{n-1}o + x^{n-2}\,o^2 + \cdot\cdot + x\,o^{n-1} + o^n - (n+1)\ o^n $$

$$ = \frac{x^{n+1} - o^{n+1}}{x-o} - (n+1)\ o^n $$

$$ \text{LHS} = \overline{x-o}\,\overline{x^{n-1} + 2x^{n-2}o + 3x^{n-3}o^2 + \cdot\cdot + no^{n-1}} \leqslant \overline{x-o}\,\underbrace{r^{n-1} + 2r^{n-1} + 3r^{n-1} + \cdot\cdot + nr^{n-1}} = \text{RHS} $$

$$ \overline{\frac{\sum_n^{\mathbb{N}} a_{n+1}x^{n+1} - \sum_n^{\mathbb{N}} a_{n+1}o^{n+1}}{x-o} - \sum_n^{\mathbb{N}} (n+1)\, a_{n+1}o^n} \leqslant \overline{x-o} \sum_n^{\mathbb{N}} \overline{a_{n+1}}\, \frac{n\,(n+1)}{2}\, r^{n-1} $$

$$ \frac{\sum_n^{\mathbb{N}} a_{n+1}x^{n+1} - \sum_n^{\mathbb{N}} a_{n+1}o^{n+1}}{x-o} - \sum_n^{\mathbb{N}} (n+1)\ a_{n+1}\ o^n = \sum_n^{\mathbb{N}} a_{n+1} \left(\frac{x^{n+1} - o^{n+1}}{x-o} - (n+1)\, o^n \right) $$

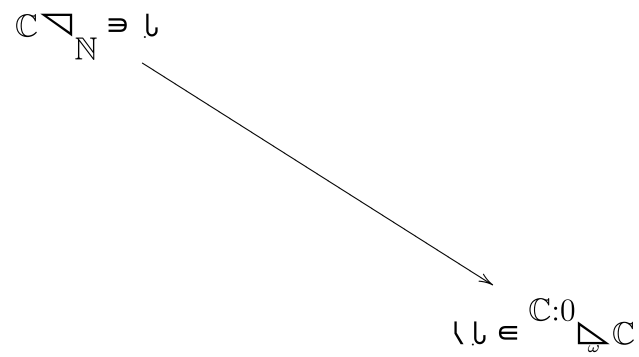
$$ \text{LHS} = \overline{\sum_n^{\mathbb{N}} a_{n+1} \left(\frac{x^{n+1} - o^{n+1}}{x-o} - (n+1)\, o^n \right)} \leqslant \sum_n^{\mathbb{N}} \overline{a_{n+1}}\, \overline{\frac{x^{n+1} - o^{n+1}}{x-o} - (n+1)\, o^n} \leqslant \text{RHS} $$

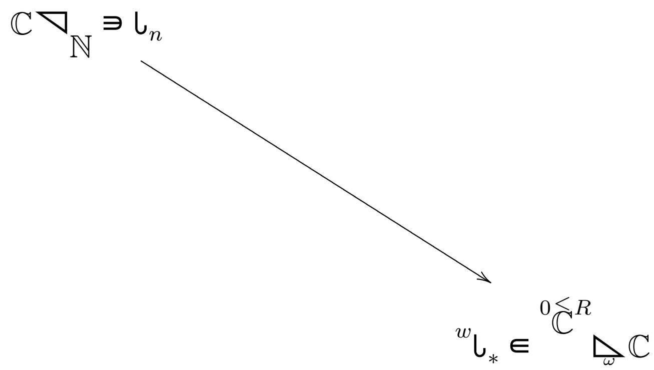
$$ \overline{o} < R \implies \bigvee \overline{o} < r < R \implies \bigwedge_{\overline{x-o} < r - \overline{o}} \overline{x} < r $$

$$ {}^{x}\daleth = \sum_{n}^{\mathbb{N}} a_n \, x^n \infty \ \mathrm{diff} \ \overline{x} < R $$

$$ {}^{x}_{m}\daleth = \sum_{n \geqslant m} n\,(n-1) \cdot\cdot (n+1-m)\; a_n \, x^{n-m} = \sum_{k}^{\mathbb{N}} (k+1) \cdot\cdot (k+m)\; a_{m+k} \, x^k $$

$$ \frac{{}^{x}_{m}\daleth}{m!} = \sum_{n \geqslant m} \begin{bmatrix} n \\ m \end{bmatrix} a_n \, x^{n-m} $$





$$\mathbb{C}\triangleleft_{d}\mathbb{N} \ni \iota_n$$

$$\searrow$$

$$^{w}\iota_* \in {}^{\mathbb{B}^d}R^{\cdot} \triangleright_{\omega} \mathbb{C}$$

$$^{w}\iota_* \Leftarrow \sum_{n}^{\mathbb{N}} \iota_n\, w^n$$

$$^{w}\iota\ \iota \Leftarrow \sum_{n}^{\mathbb{N}} w^n\ {}_n\iota \text{ power series}$$

$$^{w}\overbrace{\mathcal{P}\ltimes_{\mathbb{N}}\iota}$$

$$^{w}\mathcal{P}_n = w^n$$

$$0 < {}_n\iota \searrow 0$$

$$\lceil w \rceil \leqslant 1$$

$$w \neq 1 \Longrightarrow \sum_{n}^{\mathbb{N}} w^n\ {}_n\iota \Rightarrow$$

$$\beta_n = w^n \Longrightarrow \bar{\beta}_N \Leftarrow \sum_{n}^{N} w^n = \frac{1-w^N}{1-w} \Longrightarrow \overline{\bar{\beta}_N} \leqslant \frac{2}{\lceil 1-w \rceil} < \infty$$

$$\begin{cases} \sum_n^{\mathbb{N}} \mathfrak{l}_n u^n \Rightarrow \\ r < \overline{u} \end{cases} \Longrightarrow \sum_n^{\mathbb{N}} \overline{\mathfrak{l}_n w^n} \underset{<}{\overset{\Rightarrow}{\mathbb{C}_r}}$$

$$\sum_n^{\mathbb{N}} \mathfrak{l}_n\, u^n \Rightarrow\Longrightarrow \mathfrak{l}_n\, u^n \rightsquigarrow 0 \Longrightarrow M = \bigcup_n \overline{\mathfrak{l}_n u^n} < \infty$$

$$\overline{w} \leqslant r \Longrightarrow \sum_n^{\mathbb{N}} \overline{\mathfrak{l}_n w^n} = \sum_n^{\mathbb{N}} \overline{\mathfrak{l}_n u^n}\, \overbrace{\overline{w}/\overline{u}}^{n} \leqslant M \sum_n^{\mathbb{N}} \overbrace{r/\overline{u}}^{n} = M \frac{1}{1 - r/\overline{u}} = M \frac{\overline{u}}{\overline{u} - r}$$

$$\sum_{m \leqslant n} \overline{\mathfrak{l}_n w^n} = \sum_{m \leqslant n} \overline{\mathfrak{l}_n u^n}\, \overbrace{\overline{w}/\overline{u}}^{n} \leqslant M \sum_{m \leqslant n} \overbrace{r/\overline{u}}^{n} = M \frac{\overbrace{r/\overline{u}}^{m}}{1 - r/\overline{u}} = M\, \overbrace{\overline{w}/\overline{u}}^{m} \frac{\overline{u}}{\overline{u} - r} \rightsquigarrow 0$$

$$\sum_n^{\mathbb{N}} \mathfrak{l}_n\, u^n \Longrightarrow \underset{\text{Abel}}{\Longrightarrow} \bigwedge_{r < \overline{u}} \sum_n^{\mathbb{N}} \overline{\mathfrak{l}_n w^n} \underset{\overline{w} \leqslant r}{\Longrightarrow}$$

$$\sum_n^{\mathbb{N}} \mathfrak{l}_n\, u^n \rightsquigarrow\Longrightarrow \mathfrak{l}_n\, u^n \rightsquigarrow 0 \Longrightarrow M = {}^{\mathbb{N}}\overline{\mathfrak{l}_n u^n}_{\bullet} < \infty$$

$$\overline{w} \leqslant r \Longrightarrow \sum_n^{\mathbb{N}} \overline{\mathfrak{l}_n w^n} = \sum_n^{\mathbb{N}} \overline{\mathfrak{l}_n u^n}\, \overline{w}^n / \overline{u} \leqslant M \sum_n^{\mathbb{N}} \left(\frac{r}{\overline{u}}\right)^n = M \left(1 - \frac{r}{\overline{u}}\right)^{-1} = \frac{M\overline{u}}{\overline{u} - r}$$

$$\sum_{m \leqslant n} \overline{\mathfrak{l}_n w^n} = \sum_{m \leqslant n} \overline{\mathfrak{l}_n u^n}\, \overline{w}^n / \overline{u} \leqslant M \sum_{m \leqslant n} \left(\frac{r}{\overline{u}}\right)^n = \frac{M\left(\frac{r}{\overline{u}}\right)^m}{1 - \frac{r}{\overline{u}}} = \left(\frac{\overline{w}}{\overline{u}}\right)^m \frac{M\overline{u}}{\overline{u} - r} \rightsquigarrow 0$$

$$ {}^{0\lessgtr R}\mathbb{C} \xrightarrow[\text{stet}]{\iota\,\iota} \mathbb{C} $$

$$ \mathbb{C}^{0}_{R} \xrightarrow[\text{stet}]{\iota_*} \mathbb{C} $$

$$ o \in {}^{0\lessgtr R}\mathbb{K} \Rightarrow \overline{o} < R \Rightarrow \bigvee_{\overline{o} < r < R} \underset{\text{abel}}{\Rightarrow} \sum_{n}^{\mathbb{N}} \overline{\iota_n w^n} \xrightarrow[{}^{0\lessgtr}\mathbb{C}^{r}]{\text{glm}} $$

$$ \Rightarrow \sum_{n}^{\mathbb{N}} \overline{\iota_n w^n} \backsim \underbrace{\sum_{m}^{n} \overline{\iota_m w^m}}_{\text{poly } \Rightarrow \text{ stet}} \Rightarrow \sum_{n}^{\mathbb{N}} \overline{\iota_n w^n} \text{ stet } \mathbb{K}_{\lessgtr r} \Rightarrow \sum_{n}^{\mathbb{N}} \overline{\iota_n w^n} \text{ stet in } o $$

$$ \sum_{1 \leqslant n} n\,\iota_n\, w^{n-1} \text{ KonvRad } \underline{R} = R $$

$$ \overline{w} < R \Rightarrow \bigvee_{\overline{w} < r < R} \Rightarrow \sum_{n}^{\mathbb{N}} \overline{\iota_n}\, r^n < \infty \Rightarrow M = \curlyvee_{n} \overline{\iota_n r^n} < \infty $$

$$ \sum_{1 \leqslant n} n \overline{\iota_n w^{n-1}} = \sum_{1 \leqslant n} \overline{\iota_n}\, r^{n-1} n\, \overline{\overline{w}/r}^{\,n-1} \leqslant \frac{M}{r} \sum_{1 \leqslant n} n\, \overline{\overline{w}/r}^{\,n-1} = \frac{M}{r} \frac{1}{(1-\overline{w}/r)^2} = \frac{Mr}{(r-\overline{w})^2} < \infty $$

$$ \overline{w} < \underline{R} \Rightarrow \sum_{1 \leqslant n} n \overline{\iota_n}\, \overline{w^{n-1}} < \infty \Rightarrow \sum_{n}^{\mathbb{N}} \overline{\iota_n}\, \overline{w^n} = \overline{\iota_0} + \sum_{1 \leqslant n} \overline{\iota_n}\, \overline{w^n} \leqslant \overline{\iota_0} + \overline{w} \sum_{1 \leqslant n} n \overline{\iota_n}\, \overline{w^{n-1}} < \infty $$

$$ \sum_{1 \leqslant n} n\,\iota_n\, w^{n-1} \text{ KonvRad } R' = R $$

$$ \overline{w} < R \Rightarrow \bigvee_{\overline{w} < r < R} \Rightarrow \sum_{n}^{\mathbb{N}} \overline{\iota_n}\, r^n < \infty \Rightarrow M = {}^{\mathbb{N}}\overline{\iota_n r^n}_{\bullet} < \infty $$

$$ \sum_{1 \leqslant n} n \overline{\iota_n w^{n-1}} = \frac{1}{r} \sum_{1 \leqslant n} n \overline{\iota_n}\, r^n \left(\frac{\overline{w}}{r}\right)^{n-1} \leqslant \frac{M}{r} \sum_{1 \leqslant n} n \left(\frac{\overline{w}}{r}\right)^{n-1} = \frac{M}{r} \left(1 - \frac{\overline{w}}{r}\right)^{-2} = \frac{Mr}{r^2(1-\overline{w})^2} = \frac{Mr}{(r-\overline{w})^2} < \infty $$

$$ \overline{w} < R' \Rightarrow \sum_{1 \leqslant n} n \overline{\iota_n}\, \overline{w^{n-1}} < \infty \Rightarrow \sum_{n}^{\mathbb{N}} \overline{\iota_n}\, \overline{w^n} = \overline{\iota_0} + \sum_{1 \leqslant n} \overline{\iota_n}\, \overline{w^n} \leqslant \overline{\iota_0} + \overline{w} \sum_{1 \leqslant n} n \overline{\iota_n}\, \overline{w^{n-1}} < \infty $$

$$ {}^{0}\overset{\leq}{\mathbb{C}}{}^{R} \xrightarrow[\text{diff}]{\underset{\cdot}{\iota\iota}} \mathbb{C} $$

$$ {}^{w}\underline{\underset{\cdot}{\iota\iota}} \Leftarrow \sum_{1 \leqslant n} n\, \iota_n\, w^{n-1} $$

$$ \text{komp } K \subset {}^{0}\overset{\leq}{\mathbb{C}}{}^{R} \Rightarrow \bigvee_{r < R} K \subset {}^{0}\overset{\leq}{\mathbb{C}}{}^{r} \ni u $$

$$ {}^{w}f^{u}_{n} = \sum_{i}^{n} w^{n-1-i}\, u^{i} $$

$$ w \in K \Rightarrow \sum_{n}^{\mathbb{N}} \overline{\iota_n\, {}^{w}f^{u}_{n}} \leqslant \sum_{n}^{\mathbb{N}} \overline{\iota_n} \sum_{i}^{n} \overline{w^{n-1-i}}\,\overline{u^{i}} \leqslant \sum_{n}^{\mathbb{N}} \overline{\iota_n} \sum_{i}^{n} r^{n-1-i}\, r^{i} = \sum_{n}^{\mathbb{N}} \overline{\iota_n}\, n\, r^{n-1} < \infty \Rightarrow \sum_{n}^{\mathbb{N}} \iota_n\, {}^{w}f^{u}_{n} \overset{\text{cpt}}{\underset{{}^{0}\overset{\leq}{\mathbb{C}}{}^{R}}{\rightrightarrows}} $$

$$ w \neq u \Rightarrow \frac{\sum\limits_{n}^{\mathbb{N}} \iota_n w^n - \sum\limits_{n}^{\mathbb{N}} \iota_n u^n}{w-u} = \sum_{n}^{\mathbb{N}} \iota_n \frac{w^n - u^n}{w-u} = \sum_{n}^{\mathbb{N}} \iota_n\, w^n \sum_{i}^{n} w^{n-1-i}\, u^{i} = \sum_{n}^{\mathbb{N}} \iota_n\, {}^{w}f^{u}_{n} $$

$$ \underset{w \;\; u}{\rightsquigarrow} \sum_{n}^{\mathbb{N}} \iota_n\, {}^{u}f^{u}_{n} = \sum_{n}^{\mathbb{N}} \iota_n\, n\, u^{n-1} $$

$$\mathbb{C}_R^0 \xrightarrow[\text{diff}]{\mathsf{l}_*} \mathbb{C}$$

$$\partial_w \mathsf{l}_* \Leftarrow \sum_{1 \leqslant n} n \, \mathsf{l}_n \, w^{n-1}$$

$$w \in \mathbb{C} \ni u$$

$$^w f_n^u = \sum_{i \in n} w^{n-1-i} \, u^i$$

$$\text{komp } K \subset \mathbb{C}_R^0 \Rightarrow \bigvee_{r < R} K \subset \bar{\mathbb{C}}_r^0 \ni u$$

$$w \in K \Rightarrow \sum_n^{\mathbb{N}} \overline{\mathsf{l}_n \, {}^w f_n^u} \leqslant \sum_n^{\mathbb{N}} \overline{\mathsf{l}_n} \sum_{i \in n} \overline{w^{n-1-i}} \, \overline{u^i} \leqslant \sum_n^{\mathbb{N}} \overline{\mathsf{l}_n} \sum_{i \in n} r^{n-1-i} \, r^i$$

$$= \sum_n^{\mathbb{N}} \overline{\mathsf{l}_n} n \, r^{n-1} < \infty \Rightarrow \sum_n^{\mathbb{N}} \mathsf{l}_n \, {}^w f_n^u \xrightarrow[\mathbb{C}_R^0]{\text{cpt}}$$

$$w \neq u \Rightarrow \frac{\sum_n^{\mathbb{N}} \mathsf{l}_n w^n - \sum_n^{\mathbb{N}} \mathsf{l}_n u^n}{w - u} = \sum_n^{\mathbb{N}} \mathsf{l}_n \frac{w^n - u^n}{w - u}$$

$$= \sum_n^{\mathbb{N}} \mathsf{l}_n \, w^n \sum_{i \in n} w^{n-1-i} \, u^i = \sum_n^{\mathbb{N}} \mathsf{l}_n \, {}^w f_n^u \; {}_w \rightsquigarrow_u \; \sum_n^{\mathbb{N}} \mathsf{l}_n \, {}^u f_n^u = \sum_n^{\mathbb{N}} \mathsf{l}_n \, n \, u^{n-1}$$