-2012.

$p-$

,   ,   ,

$R-$ $C-$

. $p-$

p F_p

.

:

$$|x + y| \le \max(|x|, |y|)$$

. $Q_p - \quad p-$

.

.

.   , K (

)   .   J.C.Yoccoz [3]

.

$p-$

$p-$, $p-$ (

. .   , . .   , . .   )

([1], [3]).

$$f : K \to K$$

.

1997   . .   [3] $p-$

. $p-$

Q_p ,

. $p-$

.

$p-$.

$p-$ $p-$

. $p > 1$ Q_p $p-$

.   [5]

.   , $p-$

C_p -   (

$$x^n, \frac{x + a}{bx + c}, \frac{ax^2}{bx + 1})$$.

$p-$.

$$p-$$

$$f(x) = \frac{x + a + xA(x)}{bx + c + A(x)}$$

$p-$

.

I . $p-$ $p-$.

1.1. .

- (x, y)

$\dots(x, y)$,

1) $\dots(x, y) \ge 0$ $\dots(x, y) = 0 \Leftrightarrow x = y$,

2) $\dots(x, y) = \dots(y, x), \quad \forall x, y \in X$

3) $\forall z \in X \qquad \dots(x, y) \le \dots(x, z) + \dots(z, y),$ ( ),

$\dots(x, y)$ $(X, \dots)$ -

. 3)

$$\dots(x, y) \le \max\{\dots(x, z), \dots(z, y)\} \; (\qquad) \qquad (1.1)$$

, $\dots(x, y)$

$(X, \dots)$.

1.1. . ,

$a, b, c \in X \qquad \dots(a, b) \ne \dots(b, c)$,

$\dots(a, c) = \max\{\dots(a, b), \dots(b, c)\}$.

. $\dots(a, b) < \dots(b, c)$

.

$$\dots(a, c) \le \max\{\dots(a, b), \dots(b, c)\} = \dots(b, c)$$

$\dots(a, b) < \dots(b, c).$ $\dots(b, c) \le \max\{\dots(a, b), \dots(a, c)\} = \dots(a, c)$

$\dots(a, c) = \max\{\dots(a, b), \dots(b, c)\}.$

.

1.2. $(X, \dots)$, $a \in X$ $r \in R^+$.

$U_r(a) = \{x \in X : \dots(a, x) < r\}$ a r

$V_r(a) = \{x \in X : \dots(a, x) \le r\}$ a r

$S_r(a) = \{x \in X : \dots(a, x) = r\}$ a r

.

1.3. $(X, \dots)$, $V_r(a)$

.

. $b \in V_r(a)$. $V_r(b) = V_r(a)$

. $x \in V_r(b)$. $\dots(x, a) \le \max\{\dots(x, b), \dots(b, a)\} \le r$.

$V_r(b) \subseteq V_r(a).$ $V_r(a) \subseteq V_r(b).$ $V_r(b) = V_r(a)$.

.

1.4. $a, b \in X$ $r, s \in R^+$, $(0 < s \le r)$. $V_r(a)$ $V_s(b)$

$V_s(b) \subseteq V_r(a)$.

. $V_r(a) \cap V_s(b) \neq \varnothing$. $c \in V_r(a) \cap V_s(b)$ $V_r(c) = V_r(a)$

$V_s(c) = V_s(b)$ $V_s(c) \subseteq V_r(c)$. $V_s(b) \subseteq V_r(a)$.

.

1.5. F - . $\|\cdot\| : F \to R$,

,

1) $\|x\| \geq 0, \forall x \in F$

2) $\|x\| = 0 \iff x = 0$

3) $\|xy\| = \|x\|\|y\|$ $\forall x, y \in F$

4) $\|x + y\| \leq \|x\| + \|y\|$ $\forall x, y \in F$.

$\|\cdot\|$,

4') $\|x + y\| \leq \max\{ \|x\|, \|y\| \}$ $\forall x, y \in F$ (1.2)

, $\|\cdot\|$.

. .

$$\|x\| = \begin{cases} 1, & x \neq 0 \\ 0, & x = 0 \end{cases} ,$$

.

1.6. F - $\|\cdot\|$ F . $x, y \in F$

$\|x\| \neq \|y\|$, $\|x + y\| = \max\{ \|x\|, \|y\| \}$.

. $\|x\| > \|y\|$.

,

$\|x\| = \|(x + y) - y\| \leq \max\{\|x + y\|, \|y\|\}$

$\|x\| > \|y\|$ $\max\{\|x + y\|, \|y\|\} = \|x + y\|$ $\|x\| \leq \|x + y\|$.

$\|x + y\| \leq \max\{ \|x\|, \|y\| \} = \|x\|$. $\|x\| = \|x + y\|$. .

F $\|\cdot\|$ $\dots(x, y) = \|x - y\|$

.

$(X, \dots)$ - .

1.7. $\{x_j\}$, $x_j \in X$, $j = 1, 2, 3, \dots$ – - .

$\forall \lor > 0$ $N(\lor)$, $n, m > N(\lor)$

$\dots(x_n, x_m) < \lor$, $\{x_j\}$ - -

F $\{a_i\}$ $\{b_i\}$ -

, $i \to \infty$ $\|a_i - b_i\| \to 0$.

F -

F $\|\cdot\|$.

. Q $|\cdot|$

R .

F $\quad\quad\quad\quad\quad\quad\quad\quad$ $\|\cdot\|_1$ $\quad$ $\|\cdot\|_2$ $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$ -

- $\quad\quad$, $\|\cdot\|_1$ $\quad$ $\|\cdot\|_2$ $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$.

1.2. $p-$ $\quad\quad\quad\quad\quad$.

$\quad\quad\quad\quad$ P $\quad\quad\quad\quad\quad$ Q $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$. n $\quad$ m

$$(n, m)$$

$$\forall x \in Q \setminus \{0\}$$

$$x = p^{\varkappa(x)} \frac{m}{n}, \quad n \in N, \quad \varkappa = \varkappa(x), m \in Z, \quad (m, p) = (n, p) = 1 \tag{1.3}$$

$$|x|_p = \begin{cases} p^{-\varkappa(x)}, & x \neq 0 \\ 0, & x = 0 \end{cases} \tag{1.4}$$

1.2.1. $|\cdot|_p$ $\quad\quad\quad$ Q $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$.

1) $|x|_p \geq 0 \ \forall x \in Q \quad\quad |x|_p = 0 \Leftrightarrow x = 0.$

2) $|xy|_p = |x|_p |y|_p, \ \forall x, y \in Q.$

3) $|x + y|_p \leq \max\{|x|_p, |y|_p\}, \ \forall x, y \in Q$

1) $\quad$ 2) $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$. 3) $\quad\quad\quad\quad\quad\quad$.

$\forall x, y \in Q \quad\quad\quad\quad$ (3) $\quad\quad\quad$ $x = p^{\varkappa(x)} \dfrac{m_1}{n_1}, \ y = p^{\varkappa(y)} \dfrac{m_2}{n_2}$ $\quad\quad\quad\quad\quad\quad\quad\quad\quad$.

$\min\{\varkappa(x), \varkappa(y)\} = \varkappa(x) \quad\quad\quad$.

$$x + y = p^{\varkappa(x)} \frac{m_1}{n_1} + p^{\varkappa(y)} \frac{m_2}{n_2} = p^{\varkappa(x)} \frac{m_1 n_2 + m_2 n_1 p^{\varkappa(y) - \varkappa(x)}}{n_1 n_2}.$$

$n_1 n_2 \quad\quad p \quad\quad\quad\quad\quad\quad , \ m_1 n_2 + m_2 n_1 p^{\varkappa(y) - \varkappa(x)} \quad\quad\quad\quad p \quad\quad\quad\quad\quad\quad\quad\quad$.

$$\varkappa(x + y) \geq \varkappa(x) = \min\{\varkappa(x), \varkappa(y)\}$$

$$|x + y|_p = p^{-\varkappa(x+y)} \leq \max\{p^{-\varkappa(x)}, p^{-\varkappa(y)}\} = \max\{|x|_p, |y|_p\}$$

$\quad\quad\quad\quad\quad\quad$. $\quad\quad\quad\quad\quad\quad$.

1.2.2. $\quad\quad\quad\quad$ $|x|_p \neq |y|_p \quad\quad , \quad\quad\quad\quad\quad\quad\quad |x + y|_p = \max\{|x|_p, |y|_p\}$

$\quad$.

1.2.3. $p = 2 \quad\quad\quad\quad\quad , \ |x|_2 = |y|_2 \quad\quad , \ |x + y|_2 \leq \dfrac{1}{2}|x|_2 \quad\quad\quad\quad$.

1.2.4. $Q \quad\quad\quad\quad\quad\quad |\cdot|_p \quad\quad\quad p - \quad\quad\quad\quad\quad\quad\quad$.

$\quad\quad\quad\quad$ Q $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$ $|\cdot|$

$\quad\quad$ R $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$. $\quad\quad\quad\quad\quad\quad$ Q

$\quad\quad$ $|\cdot|_p$ $\ p - \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$ Q_p $\ p-$

.   :

?

?

.

1.2.5.(   ) [2] Q ,

$p-$ $p-$.

, $\forall y \in R \setminus \{0\}$

$$y = p^{\mathsf{x}(y)}\left(y_0 + y_1 p^{-1} + y_2 p^{-2} + ...\right),$$
$$y_j, \mathsf{x}(y) \in Z, \ 0 \le y_j \le p-1 \ , \ y_0 > 0 \ , \ (j = 0,1,2,....).$$
$$, \ \forall x \in Q_p \setminus \{0\} \ \ p-$$
$$= p^{\mathsf{x}(\ )}\left(\ _0 + \ _1 p^{1} + \ _2 p^{2} + ...\right), \tag{1.5}$$
$$_j, \mathsf{x}(\ ) \in Z, \ 0 \le \ _j \le p-1 \ , \ _0 > 0 \ , \ (j = 0,1,2,....).$$

.

1.2.6. $x \in Q_p$ *(1.5)*

$x_j, \ \ j = 0,1,2,...$

.

. $-1 = (p-1) + (p-1)p + (p-1)p^2 + ...$.

1.3. $p-$.

Q_p .

1.3.1. F . $F[x]$

F , F-   , F
K , F K

$F = \overline{K}$.

R .   , $x^2 + 1 = 0$ R

. $i, \ (i^2 = -1)$ R

. Q_p $p-$

. Q_p , $Q_p[x]$ Q_p

$Q_p(\ )$.

1.3.2. $[2]$. $Q_p(\ )$.

$Q_p(\ )$ $p-$ C_p $p-$

.

1.3.3. (   ) C_p $p-$

.

C_p [2]:

1^0. $\forall x \in C_p$ $\exists r \in Q$, $|x|_p = p^r$.

2^0. C_p -   .

1.4. $p-$ . .

C_p $p-$.

$\{x_j\} \subset {}_p$, $j = 1,2,3...$ - $x \in C_p$, $\lim\limits_{j\to\infty}|x_j - x|_p = 0$

, $\{x_j\}$ - x .

    1.4.1. $D \subset C_p$ $x \in D$. $\forall v > 0$

$\exists u > 0$, $|y - x|_p < u$ $\forall y \in D$ $|f(y) - f(x)|_p < v$

, $f : D \to C_p$ $x \in D$

    1.4.2. $D \subset C_p$ $f : D \to C_p$. f

$x \in D$, :

$$f'(x) = \lim\limits_{h\to 0} \frac{f(x+h) - f(x)}{h} .$$

$f'( )$, D , f D

.

    1.4.3. $[3]$ C_p $\{a_n\}$ -

. $\sum\limits_{n=0}^{\infty} a_n$ $\lim\limits_{n\to\infty}|a_n|_p = 0$.

$f : C_p \to C_p$ $p-$

$$f(x) = \sum\limits_{n=0}^{\infty} f_n x^n , \ f_n \in C_p \tag{1.6}$$

    1.4.4. (1.6) $|x|_p \le R$ $|x|_p > R$

$R = R(f)$, (1.6)

:

$$R = \frac{1}{\overline{\lim\limits_{n\to\infty}}|f_n|_p^{1/n}} \tag{1.7}$$

    1.4.5. $U_r(a) \subset C_p$. $f : U_r(a) \to C_p$

$$f(x) = \sum\limits_{n=0}^{\infty} f_n(x-a)^n , \ f_n \in C_p \tag{1.8}$$

, $f(x)$ $U_r(a)$

.

    II . $p-$.

$$D \subset C_p \qquad f : D \to C_p \qquad\qquad\qquad\qquad . \ (f, D)$$

$$- \ \forall x_0 \in D \qquad\qquad x_n = f^n(x_0), \quad n = 1, 2, 3, \ldots \qquad -$$

$$. \qquad f^n(x_0) = \underbrace{f \circ f \circ \ldots \circ f}_{n}(x_0) .$$

2.1. .

2.1.1. $x_0 \in D$ $\qquad\qquad f(x_0) = \dot{x_0}$, $\qquad\qquad x_0$

(f, D) .

2.1.2. x_0 . $\qquad\qquad\qquad U_r(\ _0)$

, $\forall x \in U_r(x_0)$ $\qquad \lim_{n \to \infty} f^n(x) = x_0$ $\qquad\qquad\qquad , \qquad\qquad x_0$

.

$$A(x_0) = \left\{ x \in D : \lim_{n \to \infty} f^n(x) = x_0 \right\}$$

, x_0 .

2.1.3. x_0 $\qquad\qquad , \qquad\qquad U_r(\ _0)$

, $\forall x \in U_r(x_0)$ $\qquad |x - x_0|_p < |f(x) - x_0|_p$ $\qquad , \qquad x_0$

.

2.1.4. $x_0 \in D$, $f(x)$ $\qquad\qquad\qquad\qquad . \qquad D$

$U_r(x_0)$ $\qquad\qquad , \ \forall \ldots < r \qquad S_\ldots(x_0) \qquad f(x)$

, $\qquad U_r(x_0)$ $\quad - \qquad\qquad\qquad\qquad x_0$

.

D $\qquad\qquad\qquad\qquad x_0$

$SI(x_0)$.

2.1.5. x_0 , $f(x)$ $\qquad\qquad\qquad\qquad\qquad .$

$|f'(x_0)|_p < 1$ $\qquad , \ x_0$ $\qquad\qquad ; \ |f'(x_0)|_p = 1$ $\qquad , \ x_0$

$|f'(x_0)|_p > 1$ $\qquad , \ x_0$ $\qquad\qquad\qquad .$

2.1.6. $x_0 \in D$, $f(x)$ $\qquad\qquad\qquad\qquad\qquad\qquad .$

$:$

$1^0.$ $\qquad x_0$, $f(x)$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad r > 0$

$$q = \max_{1 \le n < \infty} \left| \frac{1}{n!} \frac{d^n f}{dx^n}(x_0) \right|_p r^{n-1} < 1 \qquad\qquad (2.1)$$

$U_r(x_0) \subset D$ $\qquad , \qquad U_r(x_0) \subset A(x_0)$ $\qquad .$

$2^0.$ $\qquad x_0$, $f(x)$ $\qquad\qquad\qquad\qquad ,$

$. \ r > 0$

$$s = \max_{2 \le n < \infty} \left| \frac{1}{n!} \frac{d^n f}{dx^n}(x_0) \right|_p r^{n-1} < |f'(x_0)|_p \qquad\qquad (2.2)$$

$$U_r(x_0) \subset D \quad , \qquad U_r(x_0) \subset SI(x_0) \qquad .$$

$3^0. \qquad x_0, \; f(x) \qquad\qquad\qquad , \qquad\qquad (f,D)$

.

2.1.7. [1]( )

$f(x) \qquad V_r(x_0) \qquad\qquad\qquad 'f'(x_0) \neq 0, \; |f'(x_0)|_p = p^n \qquad .$

$V_{..}(x_0), \, ... \leq r \qquad\qquad , \qquad f \qquad\qquad V_{...+n}(y_0), \; y_0 = f(x_0)$

$, \; g(y) \qquad\qquad\qquad V_{...+n}(y_0)$

:

$$g'(y_0) = \frac{1}{f'(x_0)} \; ; \qquad |g(y) - x_0|_p = |g'(y_0)|_p |y - y_0|_p, \; y \in V_{...+n}. \tag{2.3}$$

2.2. $p -$.

$D \subset C_p \qquad f : D \to C_p$

$$f(x) = \frac{x + a + xA(x)}{bx + c + A(x)}, \qquad b \neq 0, \qquad a,b,c \in C_p \tag{2.4}$$

. $A(x) \qquad\qquad A(x) \neq -bx - c.$

(2.4) .

$$f(x) = x \qquad\qquad , \; x_{1,2} = \frac{1 - c \pm \sqrt{(c-1)^2 + 4ab}}{2b} \tag{2.5}$$

.

$A(x) \qquad D \qquad\qquad .$

$$f'(x) = \frac{c - ab + (1+c)A(x) + (bx^2 + (c-1)x - a)A'(x) + A^2(x)}{(bx + c + A(x))^2}$$

(2.5)

$$f'(x_j) = \frac{c - ab + (1+c)A'(x_j) + A^2(x_j)}{(bx_j + c + A(x_j))^2}, \qquad j = 1.2. \tag{2.6}$$

:

$$t^2 = \frac{(c-1)^2 + 4ab}{4},$$

$$_1 = 2A(x_2) + 1 + c + t,$$

$$_2 = 2A^2(x_2) + 2tA(x_2) + 4ab - 4c - t,$$

$$_3 = (1 + c - t)A^2(x_2) - (2ab - 2c - t)A(x_2),$$

2.2.1. $\qquad x_1 \qquad x_2 \qquad\qquad\qquad A(x_1) = \{(A(x_2))$

$A(x_1) = \text{\OE}(A(x_2)) \qquad\qquad ,$

1. $x_1 \qquad (x_2 \qquad) \qquad\qquad , \; x_2 \qquad (x_1 \qquad) \qquad .$

2. $x_1 \qquad\qquad\qquad , \; x_2 \qquad\qquad .$

$$\{\,(A(x_2)) = \frac{\text{"}_2 + \sqrt{\text{"}_2^{\,2} + 4\text{"}_1\text{"}_3}}{2\text{"}_1}, \quad Œ(A(x_2)) = \frac{\text{"}_2 - \sqrt{\text{"}_2^{\,2} + 4\text{"}_1\text{"}_3}}{2\text{"}_1}$$

.

$$f'(x_1)f'(x_2) = 1 \tag{2.7}$$

.

$$\text{"}_1 A^2(x_1) - \text{"}_2 A(x_1) - \text{"}_3 = 0 \tag{2.8}$$

(2.8)   (2.7)

:

$$\big[c - ab + (1+c)A(x_1) + A^2(x_1)\big]\big[(1+c-2t) + 2A(x_2)\big]^2 =$$
$$= \big[c - ab + (1+c)A(x_2) + A^2(x_2)\big]\big[(1+c+2t) + 2A(x_1)\big]^2$$

.

$A(x) = x$.

$$f(x) = \frac{x^2 + x + a}{bx + c}, \quad b \neq 0, \ a,b,c \in C_p \tag{2.9}$$

. $f(x)$.

1-   . $b = 1, \ c \neq 1$, $x_0 = \dfrac{a}{c-1}$;

2-   . $b \neq 1, \ c \neq 1$, $x_{1,2} = \dfrac{1 - c \pm \sqrt{(c-1)^2 + 4a(b-1)}}{2(b-1)}$;

3-   . $b = 1, \ c = 1, a \neq 0$.

1-   . (2.9)   :

$$f(x) = \frac{x^2 + x + a}{x + c}. \tag{2.10}$$

$x \neq \tilde{x} = -c$.

$\Pi = \{x \in C_p : \exists n \in N, \ f^n(x) = \tilde{x}\}$. Π $\tilde{x}$

. $(f, C_p \setminus \Pi) -$.

(2.10)

$$f'(x) = \frac{x^2 + 2cx + c - a}{(x+c)^2},$$

$$f^{(n)}(x) = (-1)^n n! \frac{c^2 - c + a}{(x+c)^{n+1}}$$

. $x_0 = \dfrac{a}{c-1}$

$$f'(x_0) = \frac{x_0^2 + 2cx_0 + c - a}{(x_0 + c)^2} = \frac{a + c - 1}{c^2 - c + a} \tag{2.11}$$

.

1) $\left| f\,'(x_0) \right|_p = 1$.   2.1.5 x_0

         2.1.6 x_0 .

:

$$\left| x_0 + c \right|_p = \mathsf{u} \tag{2.12}$$

2.2.2. $\left| f\,'(x_0) \right|_p = 1$, $SI(x_0) = C_p \setminus \Pi$.

. $r > 0,\ r \in R$

$$f(S_r(x_0)) \subset S_r(x_0) \tag{2.13}$$

.

$y \in S_r(x_0)$, $y = x_0 + \mathsf{x},\ \left| \mathsf{x} \right|_p = r .$ (2.10)

$$\left| f(y) - x_0 \right|_p = \left| \frac{\mathsf{x}\left(x_0^2 + 2cx_0 + c - a\right) + \mathsf{x}^2\left(x_0 + c\right)}{\left(x_0 + c\right)^2 + \mathsf{x}\left(x_0 + c\right)} \right|_p = \frac{r\left| f\,'(x_0) + \dfrac{\mathsf{x}}{x_0 + c} \right|_p}{\left| 1 + \dfrac{\mathsf{x}}{x_0 + c} \right|_p} \tag{2.14}$$

, $r < \mathsf{u}$ $r > \mathsf{u}$

:

$$\left| f(y) - x_0 \right|_p = r .$$

$f(y) \in S_r(x_0).\ y$ $f(S_r(x_0)) \subset S_r(x_0).$

$r = \mathsf{u}$ $f(S_r(x_0)) \subset S_r(x_0)$.

2.1.7   .

.

2) $\left| f\,'(x_0) \right|_p < 1$,

$$\left| \frac{a + c - 1}{c^2 - c + a} \right|_p < 1 \tag{2.15}$$

2.2.3. $\left| f\,'(x_0) \right|_p < 1$. $\sim\ >\mathsf{u}$

$f(S_\sim(x_0)) \subset S_\sim(x_0)$.

. $\sim\ >\mathsf{u}$ $y \in S_\sim(x_0)$:

$y = x_0 + \mathsf{x},\ \left| \mathsf{x} \right|_p = \sim .$ (2.14)

$$\left| f(y) - x_0 \right|_p = \frac{\sim \left| f\,'(x_0) + \dfrac{\mathsf{x}}{x_0 + c} \right|_p}{\left| 1 + \dfrac{\mathsf{x}}{x_0 + c} \right|_p} . \tag{2.16}$$

$$\left| f\,'(x_0) \right|_p < 1 ,\ \left| \frac{\mathsf{x}}{x_0 + c} \right|_p = \frac{\left| \mathsf{x} \right|_p}{\left| x_0 + c \right|_p} = \frac{\sim}{\mathsf{u}} > 1$$

. $\qquad\qquad\qquad\qquad |f(y) - x_0|_p = \sim$.

$f(y) \in S_{\sim}(x_0)$. $\quad y \qquad\qquad\qquad\qquad f\big(S_{\sim}(x_0)\big) \subset S_{\sim}(x_0)$.

.

2.2.4. . $|f\,'(x_0)|_p < 1$ $\qquad$. $\qquad U_{\mathrm{u}}(x_0) \subset A(x_0)$ $\qquad$.

. $\qquad\qquad$ 2.1.6 $\qquad$, $\qquad$ (2.15) $\qquad\qquad\qquad r > 0$

$$q = \max_{1 \le n < \infty} \left| \frac{1}{n!} \frac{d^n f}{dx^n}(x_0) \right|_p r^{\,n-1} < 1 \qquad\qquad (2.17)$$

, $\qquad\qquad V_r(x_0) \subset C_p \qquad\qquad , \qquad\qquad V_r(x_0) \subset A(x_0)$

. $\qquad$,

$$q = \max_{1 \le n < \infty} \left| \frac{1}{n!} \frac{d^n f}{dx^n}(x_0) \right|_p r^{\,n-1} = \max_{1 \le n < \infty} \left| \frac{c^2 - c + a}{(x_0 + c)^{n+1}} \right|_p r^{\,n-1} =$$

$$= \max_{1 \le n < \infty} \left| \frac{c^2 - c + a}{(x_0 + c)^2} \right|_p \left| \frac{1}{(x_0 + c)^{n-1}} \right|_p r^{\,n-1} = \max_{1 \le n < \infty} \left| \frac{(c-1)^2}{c^2 - c + a} \right|_p \left| \frac{1}{x_0 + c} \right|_p^{n-1} r^{\,n-1} =$$

$$= \max_{1 \le n < \infty} \left| \frac{c^2 - c + a - a - c + 1}{c^2 - c + a} \right|_p \frac{r^{\,n-1}}{\,|x_0 + c|_p^{n-1}\,} =$$

$$= \max_{1 \le n < \infty} \left| 1 - f'(x_0) \right|_p \frac{r^{\,n-1}}{\,|x_0 + c|_p^{n-1}\,} \le \max_{1 \le n < \infty} \left| \frac{r}{x_0 + c} \right|_p^{n-1} .$$

$r < \mathrm{u} = |x_0 + c|_p \qquad , \qquad$ (2.17) $\qquad\qquad\qquad$.

, $U_{\mathrm{u}}(x_0) \subset A(x_0)$. $\qquad\qquad\qquad$.

2.2.5. $\Pi \subset S_{\mathrm{u}}(x_0)$.

. $\tilde{x} \in \Pi \qquad S_{\mathrm{u}}(x_0)$ $\qquad\qquad$,

$\tilde{x} = -c, \quad |-c - x_0|_p = |x_0 + c|_p = \mathrm{u}$. $\qquad\qquad\qquad$ 2.2.3. $\qquad\qquad\qquad$ 2.2.4

$\Pi \subset S_{\mathrm{u}}(x_0)$. $\qquad\qquad\qquad$.

$x \in S_{\mathrm{u}}(x_0) \setminus \Pi \qquad\qquad$.

2.2.6. $|f\,'(x_0)|_p < 1 \quad x \in S_{\mathrm{u}}(x_0) \setminus \Pi \qquad$.

$$f^k(x) \in S_{\sim_k}(x_0), \ k \in N, \ \sim_k > \mathrm{u} .$$

. $\qquad\qquad\qquad\qquad x \in S_{\mathrm{u}}(x_0) \setminus \Pi, \qquad\qquad |x - x_0|_p = \mathrm{u}$.

$x = x_0 + \lessdot, |\lessdot|_p = \mathrm{u} \qquad\qquad$. (2.14)

$$\left|f(x)-x_0\right|_p=\frac{|\varsigma|_p\left|f'(x_0)+\dfrac{\varsigma}{x_0+c}\right|_p}{\left|1+\dfrac{\varsigma}{x_0+c}\right|_p}\ge u.$$

$\left|f(x)-x_0\right|_p>u$, $\sim_1>u$,

$f(x)\in S_{\sim_1}(x_0)$. 2.2.3 .

$\left|f(x)-x_0\right|_p=u$,

$$\left|f^2(x)-x_0\right|_p=\frac{\left|f(x)-x_0\right|_p\left|f'(x_0)+\dfrac{f(x)-x_0}{x_0+c}\right|_p}{\left|1+\dfrac{f(x)-x_0}{x_0+c}\right|_p}=\frac{u^2}{\left|f(x)+c\right|_p}.$$

$f(x)\in S_u(x_0)$ $f(x)=x_0+\varsigma',|\varsigma'|_p=u$.

$$\left|f^2(x)-x_0\right|_p=\frac{u^2}{\left|f(x)+c\right|_p}=\frac{u^2}{\left|\varsigma'+(x_0+c)\right|_p}.$$. -

, $\left|f^2(x)-x_0\right|_p\ge u$.

$\left|f^2(x)-x_0\right|_p>u$, $\sim_2>u$, $f^2(x)\in S_{\sim_2}(x_0)$

.

$\left|f^2(x)-x_0\right|_p=u$,

. $\left|f^{k-1}(x)-x_0\right|_p=u$, (2.14)

$$\left|f^k(x)-x_0\right|_p=\frac{\left|f^{k-1}(x)-x_0\right|_p\left|f'(x_0)+\dfrac{f^{k-1}(x)-x_0}{x_0+c}\right|_p}{\left|1+\dfrac{f^{k-1}(x)-x_0}{x_0+c}\right|_p}=\frac{u^2}{\left|f^{k-1}(x)+c\right|_p}.$$

$f^{k-1}(x)\in S_u(x_0)$ $f^{k-1}(x)=x_0+\varsigma''',|\varsigma'''|_p=u$.

$$\left|f^k(x)-x_0\right|_p=\frac{u^2}{\left|f^{k-1}(x)+c\right|_p}=\frac{u^2}{\left|\varsigma'''+(x_0+c)\right|_p}.$$.

, $\left|f^k(x)-x_0\right|_p\ge u$. $\left|f^k(x)-x_0\right|_p>u$, $\sim_k>u$

, $f^k(x)\in S_{\sim_k}(x_0)$.

$\left|f^k(x)-x_0\right|_p=u$, .

.

$$f^k(x) \in S_{\sim_k}(x_0), \quad k \in N, \quad \sim_k > \mathsf{u}.$$

2.2.3., 2.2.4.   2.2.6.   2.2.5.

.

2.2.7. $\left| f'(x_0) \right|_p < 1$. $A(x_0) = U_{\mathsf{u}}(x_0)$.

                                                                                                                ,

, $p -$ $p -$

, $p -$,   ,

,   ,

.

                                    $p -$,

2.1.   .

2.2. $p -$.

                            ,

. $p -$

                                        ,

                                    ,   .

        ,   .

                                                            .

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