

$$f(-x) - xf(x) = r|x| + 1$$

(1)

$$f(x) + xf(-x) = r|x| + 1$$

$$\xrightarrow{x = -x}$$

$$f(x) + x(xf(x) + r|x| + 1) \xrightarrow{\text{Simplify}} f(-x) = xf(x) + r|x| + 1$$

or

$$f(x) + x^2 f(x) + r|x| + x = r|x| + 1$$

$$f(x)(1 + x^2) = r|x| - r|x| - x + 1$$

$$f(x) = \frac{r|x| - r|x| - x + 1}{x^2 + 1}$$

$$\xrightarrow{x=0}$$

$$f(0) + f(0) = 1 \quad r f(0) = 1 \rightarrow f(0) = \frac{1}{r}$$

$$f(x) = x^r - rx + r \rightarrow f(x^r) = x^r - cx^r + r$$

$$xy - y = x^r + x + r \Rightarrow x^r + x + r - xy + y = 0 \quad (2)$$

$$x^r + (1-y)x + (r+y) = 0 \quad \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y^{r+1} - ry - 1 - xy \geq 0$$

$$y^r - ry - 1 \geq 0$$

$$\hookrightarrow y = -1 \text{ or } 1$$

$$\frac{-1}{+1} \pm \frac{1}{+1}$$

$$R = (-\infty, -1] \cup [1, +\infty)$$

الف) $R = \{\frac{r}{r}\}$ ب) $[0, +\infty) - \{r\}$

(5)

ج) $\frac{x^r + r}{\sqrt{x^r + r}} + \frac{1}{\sqrt{x^r + r}} \Rightarrow \frac{r}{\sqrt{r}} + \frac{1}{\sqrt{r}} = \frac{\varepsilon}{\sqrt{r}} \Rightarrow \frac{r\sqrt{r}}{r}$

$[\frac{r\sqrt{r}}{r}, +\infty)$

د) $\frac{x^r + r}{\sqrt{x^r + r}} - \varepsilon = [\frac{1}{\varepsilon}, +\infty)$

4) $y = \frac{rx^r + \varepsilon}{x^r - 1} = x^r y - y = rx^r + \varepsilon$

$x^r y - rx^r = y + \varepsilon$
 $x^r (y - r) = y + \varepsilon \rightarrow x = \sqrt{\frac{y + \varepsilon}{y - r}}$

$\frac{-\varepsilon}{+0} \quad \frac{r}{-0} \quad (-\infty, -\varepsilon] \cup (r, +\infty)$

$y = \frac{rx^r + \varepsilon}{x^r - 1}$ $\xrightarrow{x^r = 0} y = -\varepsilon$ $(-\infty, -\varepsilon) \cup (r, +\infty)$
 $\xrightarrow{x^r = +\infty} y = r$

$$\begin{aligned} \sin & \begin{cases} -1 \leq \min & \frac{-r+\varepsilon}{-1-r} = -\frac{1}{r} R = \left[-r, -\frac{1}{r}\right] \\ 1 \leq \max & \frac{r+\varepsilon}{-r} = -r \end{cases} \end{aligned}$$

الف $\frac{r_n - 1}{\varepsilon n} \xrightarrow{r} \mathbb{R} - \left\{\frac{1}{\varepsilon}\right\} \Rightarrow \left|\frac{r_n - 1}{\varepsilon n}\right| \rightarrow \left[0, +\infty\right) - \left\{\frac{1}{\varepsilon}\right\}$

سطوح این است که $r \neq 1$ اگر $r \neq 1$ به عبارت $(x-1)$ می شود

$$-1) \sqrt{\frac{a(x-1)}{+ \varepsilon(x-1)}} \rightarrow y = \sqrt{\frac{a}{\varepsilon}} = \frac{\varepsilon}{r} = 1, 5$$

$$R = \{1, 5\}$$

$$y = x|x| - rx \xrightarrow{x > 0}$$

$$y = x^2 - rx \rightarrow x = -\frac{b}{2a} = 1 \quad y = -1$$

$$R = [-1, +\infty)$$

$$x \leq 0 \rightarrow -x^2 - rx \rightarrow x = -\frac{b}{2a} = -1 \quad y = 1$$

$$[-1, +\infty) \cup (-\infty, 1] = \mathbb{R} \quad R = (-\infty, 1]$$

$$R = \mathbb{R}$$

