

آین صحت

$f(x) = r|x| + 1 + n f(n)$

$f(-n) - n f(n) = r|n| + 1$
 $f(n) + n f(-n) = r|n| + 1$
 $\rightarrow f(n)(n^r + 1) = (r|n| + 1)(1 - n)$
 $\rightarrow f(n) = \frac{(r|n| + 1)(1 - n)}{n^r + 1}$

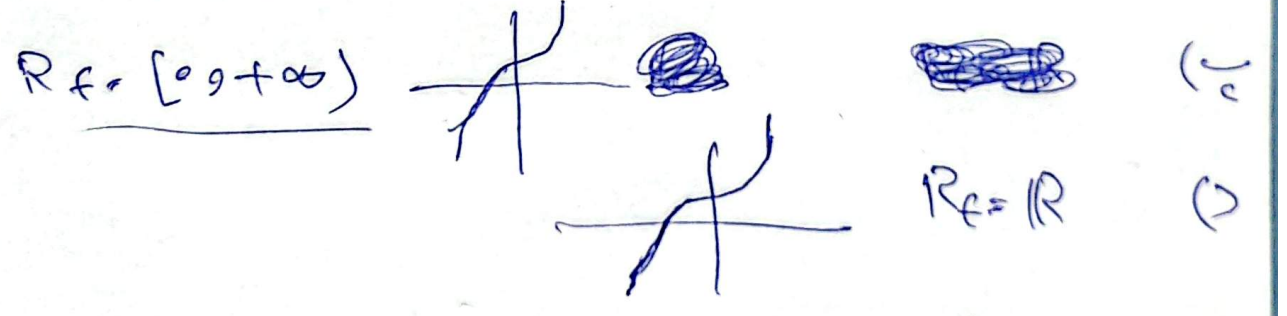
$\xrightarrow{n \rightarrow 0} r f(0) = 1 \rightarrow f(0) = \frac{1}{r}$
 $f(n) = n^r - r n + \frac{1}{r}$

$f(n^r) = n^r - r n^r + \frac{1}{r}$

~~$y n - y = n^r + n + r \rightarrow y n - y = n^r + n + r$~~
 $y n - y = n^r + n + r \rightarrow n^r + (1 - y)n + (r + y) \xrightarrow{\Delta \geq 0} y^r - 4y + 1 \geq 0$
 $(y - r)(y + 1) \geq 0 \rightarrow R_f = (-\infty, -1] \cup [r, +\infty)$

$\min \left[r \times \frac{y}{y^r} - \Delta \times \frac{1}{y^r} \leq 1, 1 - \frac{r \Delta}{\lambda} \leq \frac{-1}{\lambda} \right] R_f = \left[\frac{-1}{\lambda}, +\infty \right)$

$\max \left[-9 + (1 - \Delta) \leq r \right] R_f = [0, r]$



$\frac{a}{c} = f \sqrt{f + r} \quad R_f = [0, +\infty)$

$\leq \frac{n^r + r + 1}{\sqrt{n^r + r}} = \sqrt{n^r + r} + \frac{1}{\sqrt{n^r + r}} \xrightarrow{n \rightarrow \infty} \sqrt{r} + \frac{1}{\sqrt{r}} \leq \frac{r}{\sqrt{r}} \quad R_f = \left[\frac{r}{\sqrt{r}}, +\infty \right)$

$n^r + r + \frac{1}{n^r + r} = r \quad n^r + r + \frac{1}{n^r + r} \xrightarrow{n \rightarrow \infty} r + \frac{1}{r} \leq \frac{1}{r} \quad \frac{1}{r} = r \leq \frac{1}{r}$
 $R_f = \left[\frac{1}{r}, +\infty \right)$

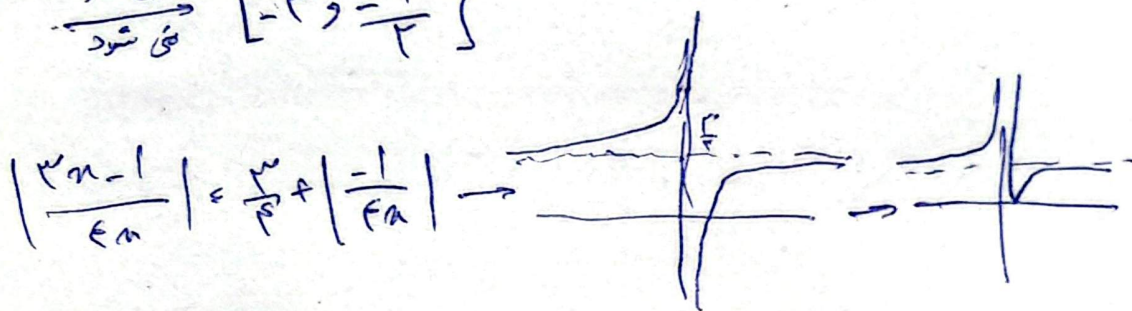
$$y \neq -y \leq x^2 + 9 \rightarrow -x^2 - y \leq x^2 (x - y) \rightarrow x^2 \leq \frac{9 - y}{x - y} \leftrightarrow x \leq \sqrt{\frac{9 - y}{y - 9}} \quad (7)$$

$$R_f = (-\infty, -9] \cup [9, +\infty) \xrightarrow{x \rightarrow -\infty} y \leq -9 \xrightarrow{x \rightarrow +\infty} y \leq 9$$

خرج صفری شود $R_f = (-\infty, -9] \cup [9, +\infty)$

$$\frac{\sin x \leq 1}{-1 \leq \sin x \leq 1} \rightarrow \frac{x^2 + 9}{-1 - 9} \leq \frac{-1}{9} \xrightarrow{\sin x \leq 1} \frac{x^2 + 9}{1 - 9} \leq -9$$

خرج صفر
بقی شود $[-9, -\frac{1}{9}]$



(الف) $R_f = [9, +\infty)$

$$y \leq \sqrt{\frac{9(x^2 + 9)}{f(x^2 + 9)}} \Rightarrow y \leq \frac{9}{f} \quad R_f = \left\{ \frac{9}{f} \right\}$$

$$x \geq 0 \rightarrow x^2 - 2x \leftrightarrow \min \begin{bmatrix} +1 \\ -1 \end{bmatrix}$$

$R_f = \mathbb{R}$ (9)

$$x \leq 0 \rightarrow -x^2 - 2x \leftrightarrow \max \begin{bmatrix} -1 \\ +1 \end{bmatrix}$$

