

نماییه n رواز قدر مطلق بیاری بیرون!

$$\begin{cases} f(-n) - n f(n) = 2|n| + 1 \rightarrow 2n + 1 \\ f(n) - (-n) f(-n) = 2|-n| + 1 \rightarrow f(n) + n f(-n) = -2n + 1 \end{cases}$$

$$\begin{cases} f(-n) - f(n) = 2n + 1 \quad (x=n) \\ f(n) + n f(-n) = -2n + 1 \end{cases} \Rightarrow \begin{cases} -n f(-n) + n f(n) = -2n^2 - n \\ f(n) + n f(-n) = -2n + 1 \end{cases}$$

$$\Rightarrow n^2 f(n) + f(n) = -2n^2 - 2n + 1 \rightarrow f(n) = \frac{-2n^2 - 2n + 1}{n^2 + 1}$$

صفحه آخر...

$$f(n) + f(0) = n^2 - 2n + 1 \xrightarrow{n=0} 2f(0) = 1 \rightarrow f(0) = \frac{1}{2}$$

$$f(n) = n^2 - 2n + 1 \Rightarrow f(n^2) = (n^2)^2 - 2(n^2) + 1 = n^4 - 2n^2 + 1$$

$$y = \frac{n^2 + n + 1}{n - 1} \rightarrow y(n - 1) = n^2 + n + 1 \rightarrow n^2 + (1 - y)(n - 1) + y = 0$$

$$\rightarrow \Delta \geq 0 \Rightarrow 1 - 2y + y^2 - 2y - 1 \geq 0 \rightarrow y^2 - 4y \geq 0$$

$$\frac{-1}{+0} \quad \frac{4}{-0} \Rightarrow R = (-\infty, -1] \cup [4, +\infty)$$

الف) $2n^2 - 8n + 1 \rightarrow \text{ext} \left| \frac{0}{-4} \right| \rightarrow R = \left[-\frac{1}{2}, +\infty \right)$

ب) $\sqrt{-n^2 + 4n - 8} \rightarrow \text{ext} \left| \frac{4}{-1} \right| \rightarrow R = [0, 2]$

ج) $\sqrt{n^4 - 2n^2 + 1} \rightarrow \sqrt{\mathbb{R}} = [0, +\infty)$

د) $\sqrt[n]{n^3 - 4n^2 + 6n + 2} \rightarrow \sqrt[n]{\mathbb{R}} \rightarrow \sqrt[n]{[0, +\infty)} \rightarrow R = \mathbb{R}$

الف) $y = \frac{2n + 1}{2n - 4} \rightarrow (2x - 4) \neq (2)(1) \Rightarrow R = \mathbb{R} - \left\{ \frac{3}{2} \right\}$

ب) $y = \sqrt{\frac{2n + 1}{n - 2}} \rightarrow R = \left[\mathbb{R} - \left\{ \frac{1}{2} \right\} \right] = [0, +\infty) - \left\{ \frac{1}{2} \right\}$

ج) $y = \frac{n^2 + 2}{\sqrt{n^2 + 1}} = \sqrt{n^2 + 1} + \frac{1}{\sqrt{n^2 + 1}} \rightarrow Ry = \left[\sqrt{1} + \frac{1}{\sqrt{1}}, +\infty \right) = \left[\frac{4\sqrt{2}}{3}, +\infty \right)$

د) $y = n^2 + \frac{1}{n^2 + 2} \rightarrow n^2 + 2 + \frac{1}{n^2 + 2} - 2 \rightarrow R = \left[2 + \frac{1}{2} - \varepsilon, +\infty \right) = \left[\frac{5}{2}, +\infty \right)$

$$y = \frac{r n^r + \varepsilon}{n^r - 1} \xrightarrow{+\infty} \frac{r}{(1-\frac{1}{n})} = r \xrightarrow{\text{مطلوب}} R_y = (-\infty, -r] \cup (r, +\infty)$$

$$\lim_{n \rightarrow \infty} y n^r - y = r n^r + \varepsilon \rightarrow (r - y) n^r + \varepsilon + y = 0 \rightarrow \Delta \geq 0 \rightarrow r y^r + \varepsilon y - r \geq 0$$

$$\rightarrow y^r + y - r \geq 0 \rightarrow (y + \varepsilon)(y - r) \geq 0$$

$$f(n) = \frac{r a_n + \varepsilon}{a_n - r} \xrightarrow{a_n=1} \frac{r + \varepsilon}{-r} = -r$$

$$\xrightarrow{a_n=-1} \frac{-r + \varepsilon}{-\varepsilon} = -\frac{1}{r} \rightarrow R_f = [-r, -\frac{1}{r}]$$

د) $y = \left| \frac{r n - 1}{\varepsilon n} \right|$ $\rightarrow$ جانب ايسر = $\frac{r}{\varepsilon}$ $\rightarrow$ جانب يمين = 0

مطلوب $\rightarrow$ $R_y = [0, +\infty)$

ج) $y = \sqrt{\frac{9n-1}{4n-1}} = \sqrt{\frac{(n-1)9}{(n-1)4}} = \frac{3}{2}$

$R_y = \{ \frac{3}{2} \}$

$R_y = \mathbb{R}$

$|f(n)+1|$ $\rightarrow$ $R = [0, +\infty)$

۱- بجای n ، $-n$ قرار می دهیم و یک دستگاه می سازیم:

$$\begin{aligned} f(-n) - n^r f(n) &= 2|n| + 1 \xrightarrow{\times n} \begin{cases} n f(-n) - n^r f(n) = 2n|n| + n & (I) \\ f(n) + n f(-n) = 2|n| + 1 & (II) \end{cases} \\ f(n) + n f(-n) &= 2|n| + 1 \end{aligned}$$

$$\underline{II - I} \rightarrow (1 + n^r) f(n) = 2(1 - n)|n| + 1 - n \Rightarrow f(n) = \frac{(1 - n)(2|n| + 1)}{1 + n^r}$$