

$f(-n) - n f(n) = f(n) + n f(-n) \Rightarrow n = \frac{f(-n) - f(n)}{f(n) + f(n)} \Rightarrow \frac{n-1}{2} = \frac{-2f(n)}{2f(-n)+2f(n)}$
 $\Rightarrow \frac{1-n}{n+1} = \frac{f(n)}{f(-n)} \Rightarrow f(-n) = f(n) \frac{n+1}{1-n} \Rightarrow \left\{ \begin{array}{l} n > 0 \rightarrow f(n) \frac{n+1}{1-n} = 2n+1 - n f(n) \\ n < 0 \rightarrow f(n) \frac{n+1}{1-n} = -2n+1 - n f(n) \end{array} \right.$
 $\Rightarrow f(n) = \frac{2n^2 - 2n + 1}{n^2 - 2n + 1}$ جواب

$n=0 \Rightarrow 2f(0)=6 \Rightarrow f(0)=3 \Rightarrow f(n) = n^2 - 2n + 3$

$\Rightarrow f(n^2) = n^4 - 2n^2 + 3$

$\forall n-y = n^2 + n + 2 \Rightarrow n^2 + (1-y)n + y + 2 = 0 \Rightarrow n = \frac{y-1 \pm \sqrt{(1-y)^2 - 4(y+2)}}{2}$

$\Rightarrow (y-1)^2 - 4(y+2) \geq 0 \Rightarrow y^2 - 2y + 1 - 4y - 8 \geq 0 \Rightarrow y^2 - 6y - 7 \geq 0$

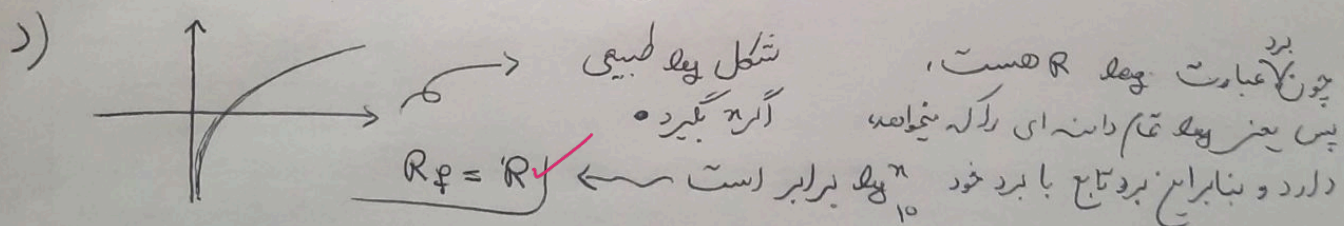
$\frac{-1}{+} \frac{7}{-} \Rightarrow R_f = R - (-1, 7)$

الف) $\xrightarrow{\min \text{ دار}} n_{\min} = \frac{-b}{2a} = \frac{5}{2} \Rightarrow y_{\min} = 2\left(\frac{5}{2}\right)^2 - 5\left(\frac{5}{2}\right) + 1 = -\frac{17}{2}$

$\Rightarrow R_f = \left[-\frac{17}{2}, +\infty\right)$

ب) $\xrightarrow{\text{داخل رادیکال}} n_{\max} = \frac{-6}{-2} = 3 \Rightarrow y_{\max} = 2 \Rightarrow R_f = [2, +\infty)$

ج) $\xrightarrow{\text{زیر رادیکال بردش R هست}} R_f = [0, +\infty)$



الف) $n = \frac{6y+4}{2y-3} \Rightarrow R_f = R - \left\{\frac{2}{3}\right\}$

ب) $\xrightarrow{\text{داخل رادیکال}} \frac{6n+1}{n-2} \xrightarrow{\text{بردار}} R - \{2\} \Rightarrow R_f = [0, +\infty) - \{2\}$

ج) $\frac{n^2+4}{\sqrt{n^2+3}} = \sqrt{n^2+3} + \frac{1}{\sqrt{n^2+3}} \xrightarrow{n=0} y = \frac{4}{\sqrt{3}} \Rightarrow R_f = \left[\frac{4}{\sqrt{3}}, +\infty\right)$

د) $n^2+4 + \frac{1}{n^2+3} - 4 \xrightarrow{n=0} y = \frac{1}{3} \Rightarrow R_f = \left[\frac{1}{3}, +\infty\right)$

$$y n^2 - y = n^2 + \varepsilon \Rightarrow (n-y)n^2 + y + \varepsilon = 0 \Rightarrow n = \pm \sqrt{-\frac{y+\varepsilon}{n-y}}$$

$$\Rightarrow \frac{y+\varepsilon}{n-y} \leq 0 \Rightarrow \frac{-\varepsilon}{-1 + \frac{1}{n}} \Rightarrow R_f = R - (-\varepsilon, 3]$$

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$$n^2 - y = 0 \Rightarrow y = -\varepsilon$$

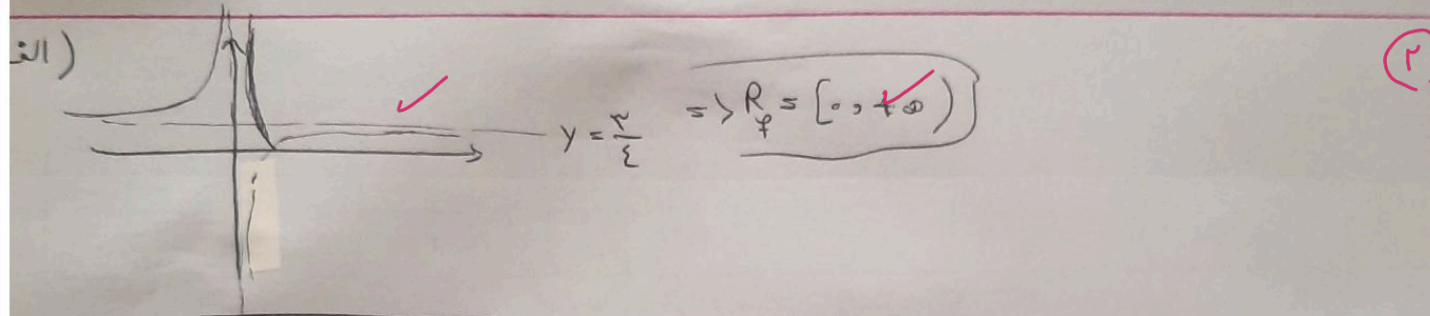
$$n^2 - y = \infty \Rightarrow y = 3 \Rightarrow R_f = (-\infty, -\varepsilon] \cup (3, +\infty)$$

چون از حد بدست می‌آید، باز است.

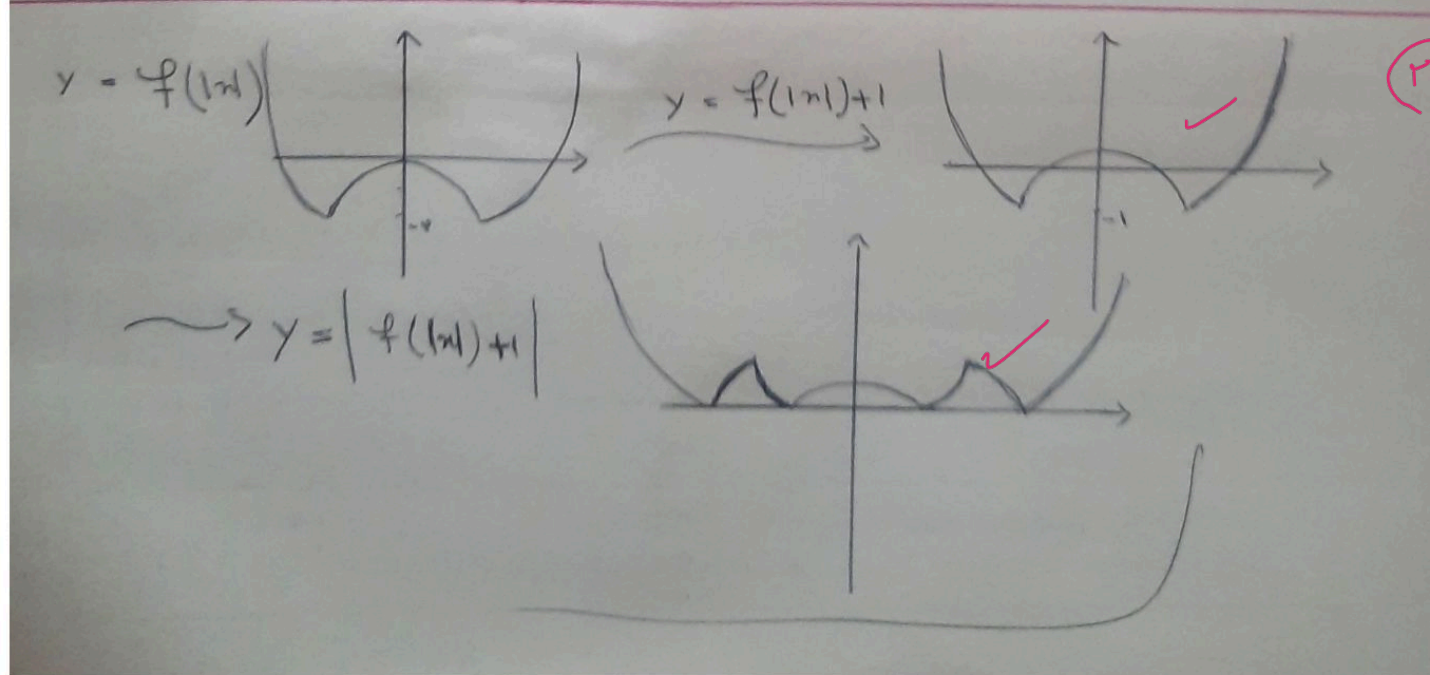
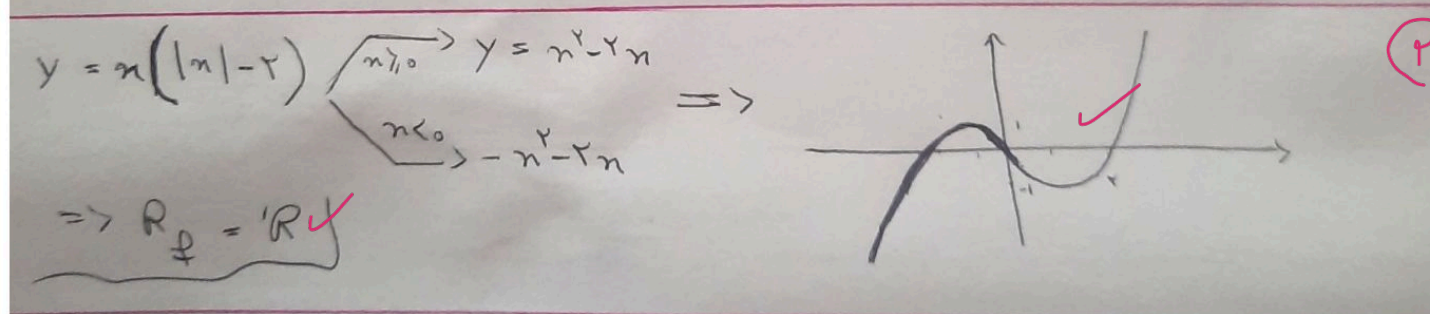
$$\sin n = -1 \Rightarrow y = -\frac{1}{n}$$

$$\sin n = 1 \Rightarrow y = -n \Rightarrow R_f = [-n, -\frac{1}{n}]$$

نمی‌تواند صفر شود *



$$y = \sqrt{\frac{9}{\varepsilon} \times \left(\frac{n-2}{n-2}\right)} = 1/2 \Rightarrow R_f = \left\{\frac{n}{2}\right\}$$



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

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

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