

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

$$\rightarrow n(n-2) = 0 \rightarrow n = 0 \text{ یا } n = 2$$

$$\xrightarrow{n < 1} \frac{1}{n-1} = -n+1 \rightarrow -n^2 + 2n - 1 = 1 \rightarrow n^2 - 2n + 2 = 0$$

$$\Delta < 0$$

(ب) $\left| \frac{n-2}{n+1} \right| > 1 \rightarrow \frac{n-2}{n+1} > 1 \rightarrow \frac{n-2}{n+1} > \frac{n-2}{n+1} \rightarrow (-2, -\frac{1}{3})$ ①

$\rightarrow \frac{n-2}{n+1} < -1 \rightarrow \frac{n-1}{n+1} < 0 \rightarrow \frac{1}{n+1} < 0 \rightarrow (-\frac{1}{3}, \frac{1}{3})$ ②

① ∪ ② = $n \in (-2, -\frac{1}{3}) \cup (-\frac{1}{3}, \frac{1}{3})$

(الف) $\left| \frac{2n-1}{n} \right| < 2 \rightarrow -2 < \frac{2n-1}{n} < 2$

① $\frac{2n-1}{n} + 2 > 0 \rightarrow \frac{4n-1}{n} > 0 \rightarrow \frac{1}{n} > \frac{1}{4} \rightarrow n < 4$

② $\frac{2n-1}{n} - 2 < 0 \rightarrow \frac{-1}{n} < 0 \rightarrow \frac{1}{n} > 0 \rightarrow n > 0$

پس: $n \in (0, 4)$

$$n^2 - n - 4 < 0 \quad (n-4)(n+1) < 0 \quad \frac{-1}{-4+1} \rightarrow (-4, 1)$$

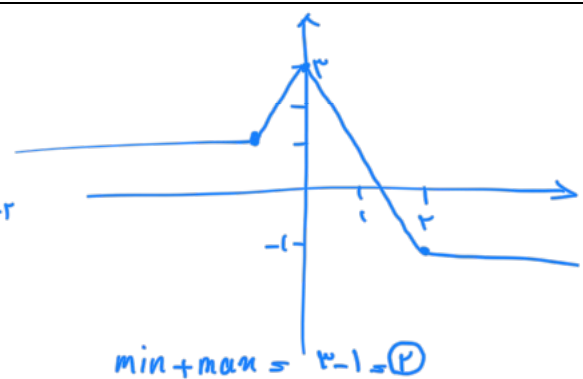
$$n+4 < -n^2 \rightarrow n^2 + n + 4 < 0 \rightarrow \Delta < 0$$

$$|n-\alpha| < \beta \rightarrow -\beta < n-\alpha < \beta \rightarrow \alpha-\beta < n < \alpha+\beta$$

$$\begin{cases} \alpha - \beta = -4 \\ \alpha + \beta = 1 \end{cases} \rightarrow \alpha = \frac{1}{2}$$

$$y = \frac{|n+1|}{-1} - \frac{|2n|}{0} + \frac{|n-2|}{2}$$

$-n-1+2n-n+2 = 1$	$n+1+2n-n+2 = 3n+3$	$n+1-2n-n+2 = -3n+3$	$n+1-2n+n-2 = -1$
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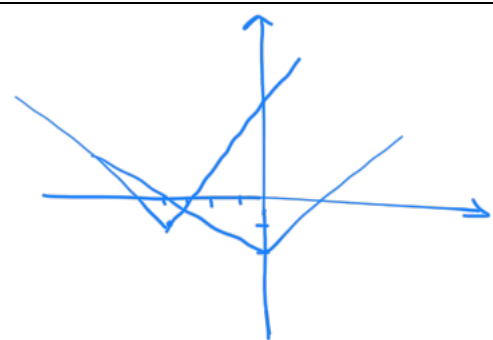


$$y = \left| \frac{1}{2}n \right| - 2 \rightarrow \left| \frac{n}{2} \right| - 2 = \left| \frac{n}{2} + 1 \right| - 1$$

$$|t| - |t+2| = 1 \rightarrow |t| = |t+2| + 1$$

$$\xrightarrow{\text{فصل}} \frac{1}{2}n = 1 + \frac{1}{2} + 2 + \frac{1}{2} + 2 \rightarrow 4t = -9 \rightarrow t = -\frac{9}{4}$$

$$\rightarrow \frac{1}{2}n = -\frac{9}{2} \rightarrow n = -9$$



$$f(n) = \frac{1}{n} - \left(\left\lfloor \frac{n+1}{n} \right\rfloor \right) = \frac{1}{n} - \underbrace{\left\lfloor \frac{1}{n} \right\rfloor} = 1 \quad (1)$$

$$\rightarrow 0 \leq t < 1 \xrightarrow{-1} -1 \leq t-1 < 0$$

$$\rightarrow R_f = \underline{[-1, 0)}$$