

$$\left(f(-n) - n f(n) = 2|n| + 1 \right) \times 2 \rightarrow 2f(-n) - 2n f(n) = 2|n| + 2n$$

$$f(n) + n f(-n) = 2|-n| + 1 \rightarrow f(n) + n f(-n) = 2|n| + 1$$

همونند خودت گفتی

$$f(n)(1-n^2) = 2|n| + 2n + 2|-n| + 1$$

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

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

$$f(n^2) = ?$$

$$f(n) + f(0) = n^2 - 2n + 4$$

$$2f(0) = 4 \rightarrow f(0) = 2$$

$$f(n) = n^2 - 2n + 2$$

$$f(n^2) = n^4 - 2n^2 + 2$$

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

$$xy - y = n^2 + n + 1$$

$$n^2 + n(1-y) + 1 + y$$

$$1 + y^2 - 2y - 1 + 2y \geq 0 \rightarrow y^2 - 2y + 2 \geq 0 \rightarrow (y-1)^2 + 1 \geq 0$$

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

$$الف) y = 2n^2 - 2n + 1$$

$$\min \left| \frac{\Delta}{2} \right|$$

$$2 \times \frac{20}{17} - \frac{20}{2} + 1 = -\frac{17}{17}$$

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

$$ب) y = \sqrt{-n^2 + 4n - 8}$$

$$\min \left| \frac{\Delta}{4} \right|$$

$$4 + 11 - 8 = 7$$

$$\sqrt{(-\infty, +\infty)} = [-, +\infty)$$

$$ج) y = \sqrt{n^4 - 2n^2 - 2n + 1}$$

$$\rightarrow \text{بزرگترین برابری} \rightarrow \sqrt{1R} = [-, +\infty)$$

$$د) y = \log \left(\frac{n^4 - 4n^2 + 7n - 2}{n^2 - 4} \right) \rightarrow R_f = 1R$$

این برابری
در 1R
فقط
صورت

$$الف) \frac{2n+1}{2n-4}$$

$$\rightarrow \text{مخرج صفر} = 1R = 1R - \left\{ \frac{4}{2} \right\}$$

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

$$ج) y = \frac{n^2 + 2}{\sqrt{n^2 + 2}} \rightarrow \sqrt{n^2 + 2} + \frac{1}{\sqrt{n^2 + 2}}$$

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

$$1R = \left[\frac{1}{2} + \frac{1}{\sqrt{2}} + \infty \right) = \left[\frac{2}{\sqrt{2}} + \infty \right)$$

$$y = \frac{2n^2 + 5}{n^2 - 1} \rightarrow ny - y = 2n^2 + 5 \rightarrow n^2(y - 1) = y + 5$$

$$n^2 = \frac{y+5}{y-1} \rightarrow \frac{-5}{+1-1} \rightarrow R_f, (-\infty - 5] \cup (1 + \infty)$$

نقطه $\rightarrow$ $y = -5$
 عرج می زند منفرجه
 $+ \infty = 1$
 جز در $+ \infty$ باز است

$$R_f = (-\infty - 5] \cup (1 + \infty)$$

(۲) (۶)

$$f(n) = \frac{2 \ln n + 5}{\ln n - 1}$$

در سر بردارند

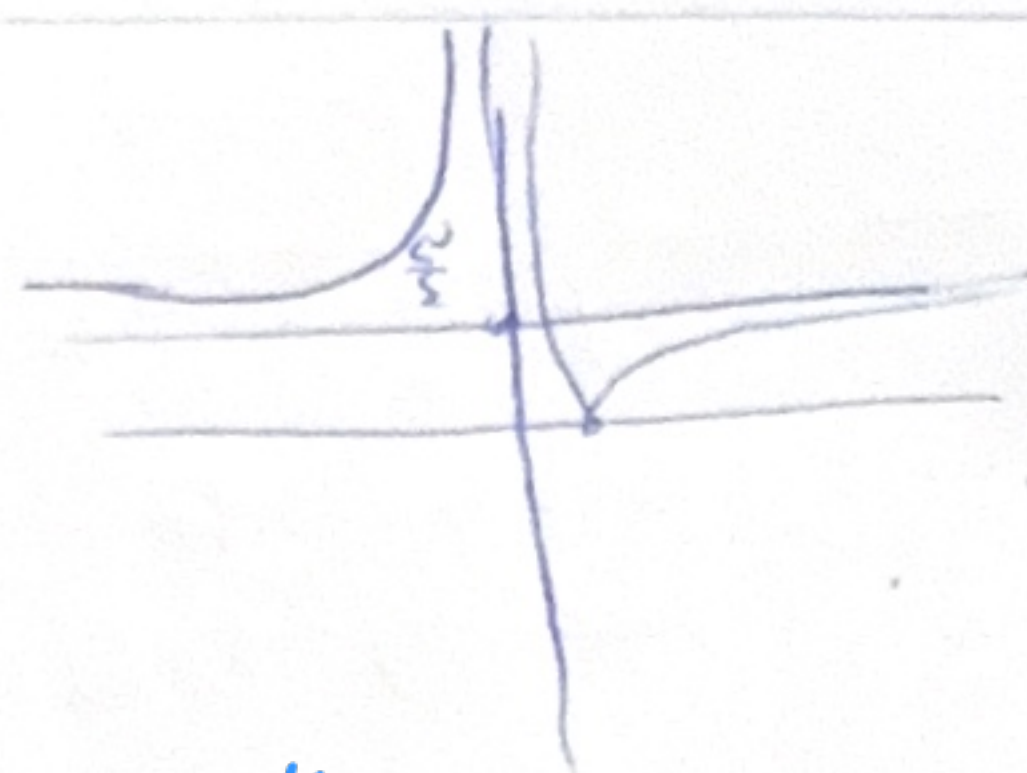
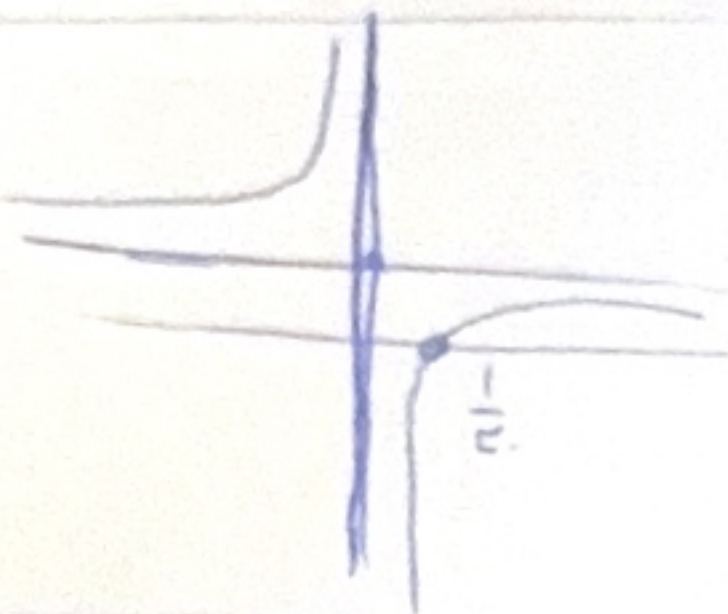
$$P_{max} = 1 \rightarrow \frac{5}{-1} = -5$$

$$P_{min} = -1 \rightarrow \frac{1}{-5} = -\frac{1}{5}$$

$$[-5, -\frac{1}{5}]$$

(۲) (۷)

$$y = \left| \frac{2n-1}{5n} \right|$$



(۱, ۵)

$$IR = [0, +\infty)$$

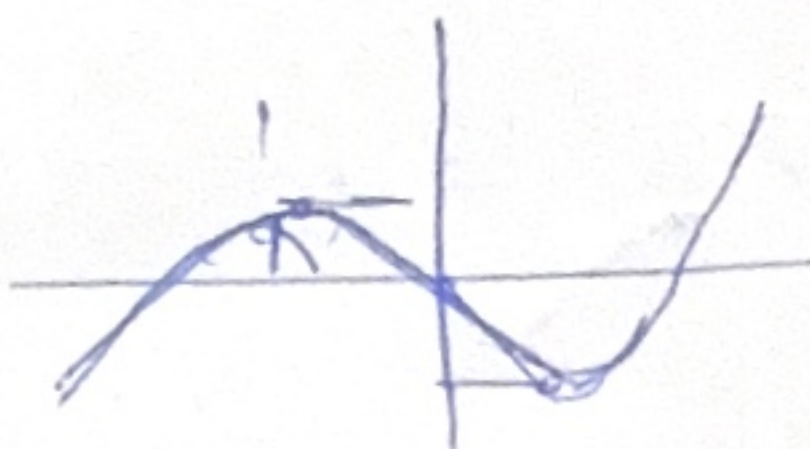
$$b) \sqrt{\frac{4n-1}{5n-1}}$$

$$\rightarrow \sqrt{\frac{4(2-1)}{5(2-1)}} = \left\{ \frac{2}{5} \right\}$$

$$R_y = \left\{ \frac{2}{5} \right\}$$

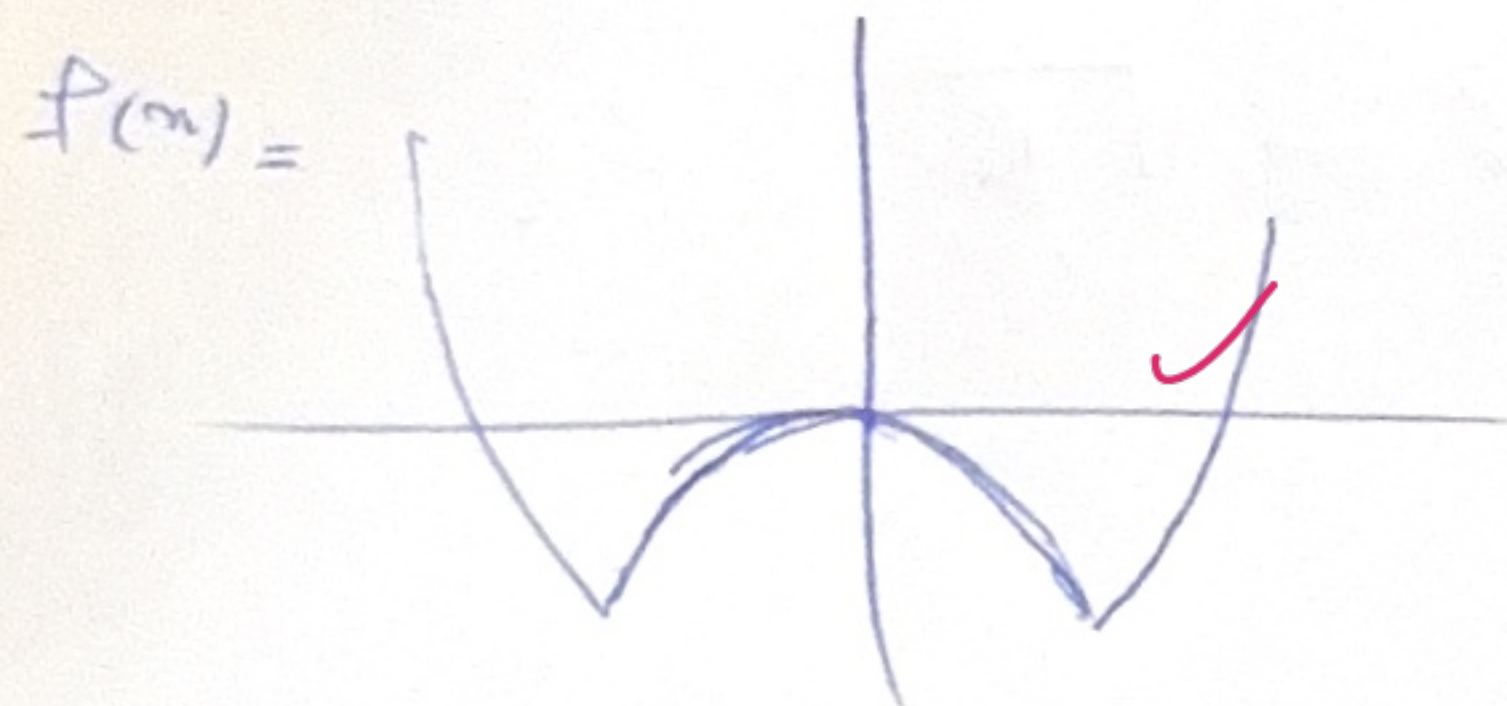
$$y = n/|n| - 2n \xrightarrow{n > 0} n^2 - 2n$$

$$\xrightarrow{n < 0} -n^2 - 2n$$

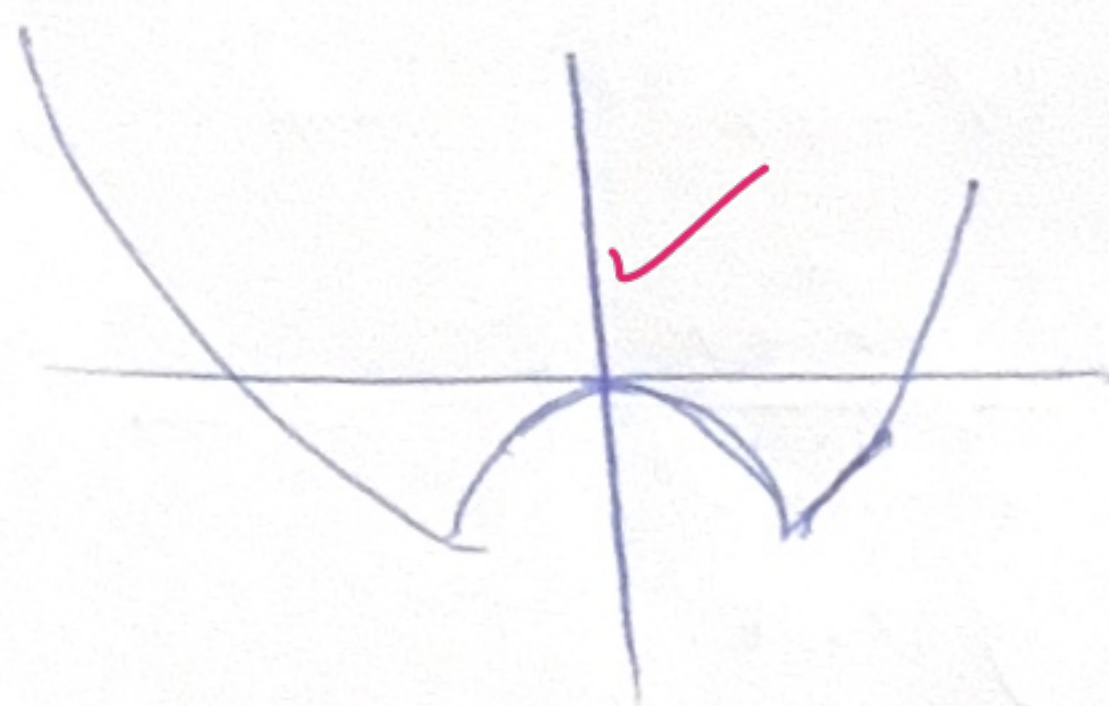


$$[IR] = R_f$$

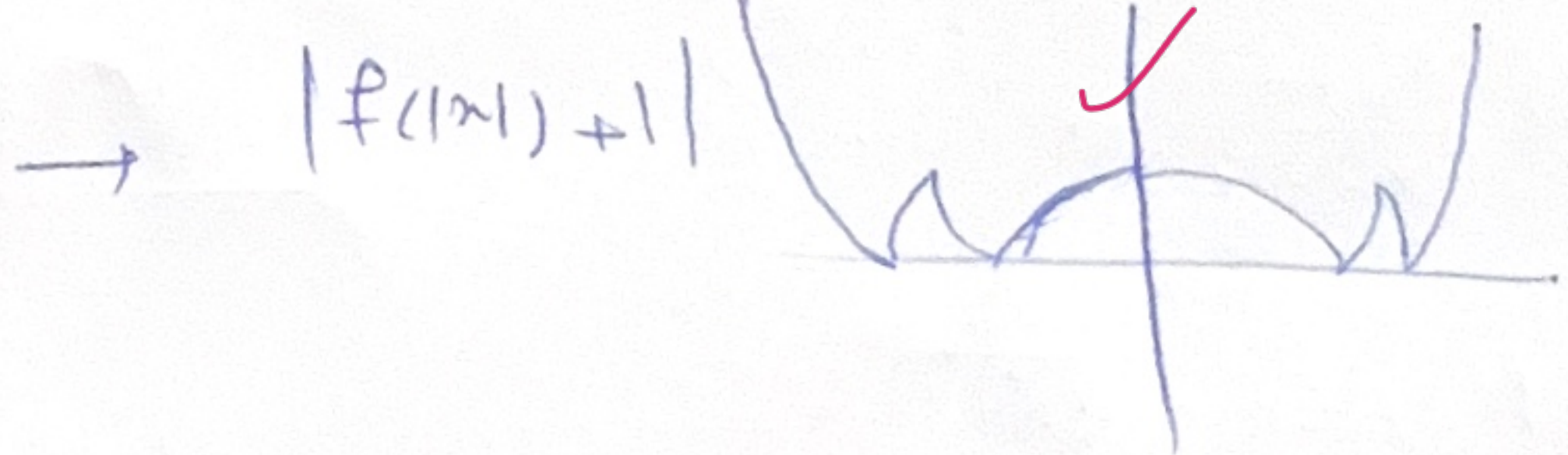
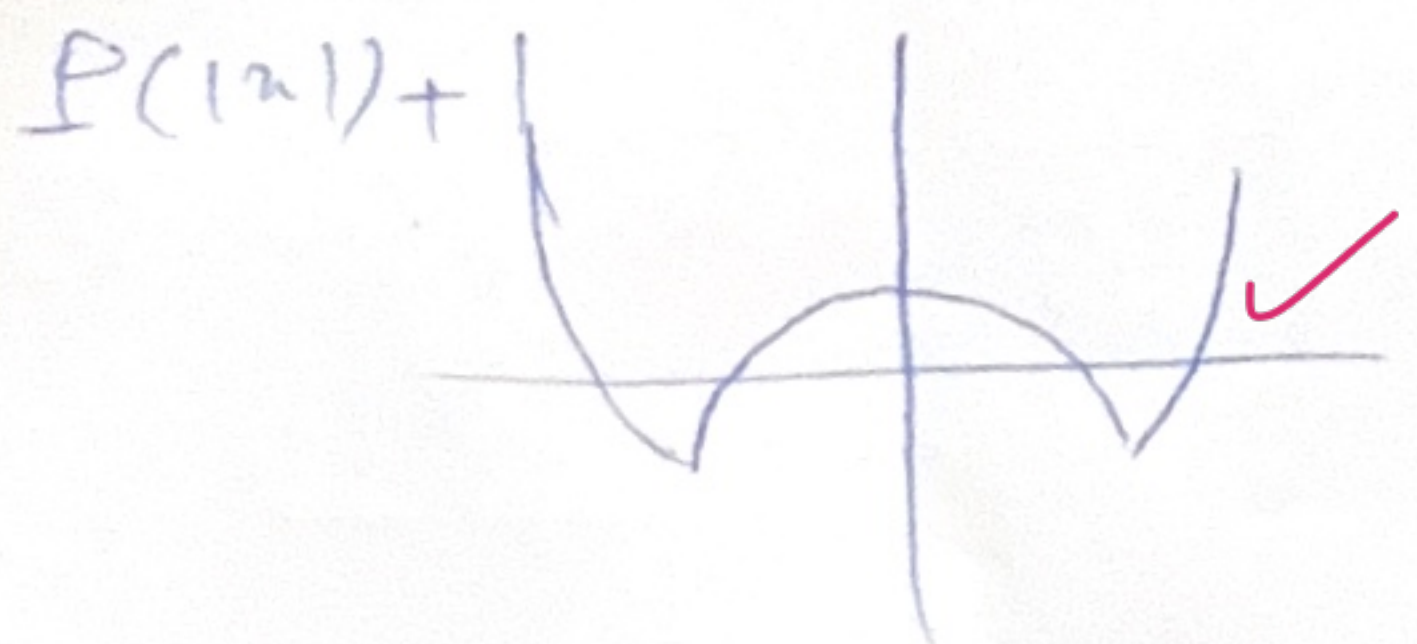
(۲) (۴)



$$f(|n|)$$



(۲) (۱۰)



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

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

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