

$$f(x) = \begin{cases} 3(x+1) + 11 \rightarrow 3x + 12 & x \geq 1 \\ f(x+1) - 1 \rightarrow f(x) + 1 & x < 1 \end{cases}$$

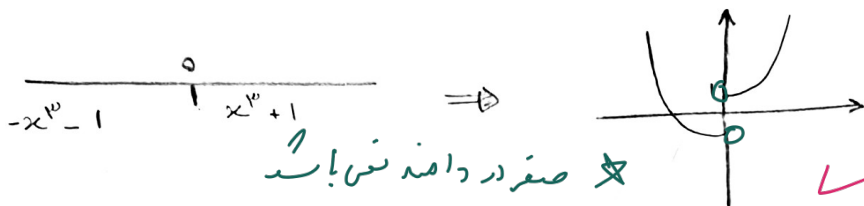
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امتحان حلالاتي

$$f(1-x) = \begin{cases} 3(1-x) + 11 \rightarrow 3x + 12 \rightarrow -3x + 12 & x \leq 0 \\ f(1-x) + 11 \rightarrow f(x) - 1 \rightarrow -f(x) - 1 & x > 0 \end{cases}$$

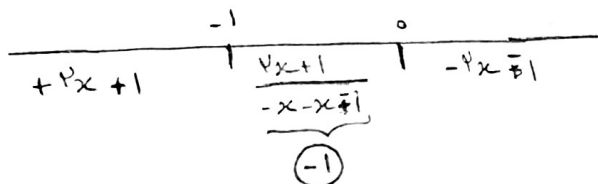
$$f(x+1) = \begin{cases} 3(x-1) + 11 \rightarrow 3x + 8 & x \geq 1 \\ f(x-1) + 11 \rightarrow f(x) + 1 & x < 1 \end{cases}$$

$$\Rightarrow f(x) < x^3 \Rightarrow (x^3+x)^3 < x^3 \Rightarrow x^3+x < x \Rightarrow x^3 < 0 \Rightarrow x < 0$$

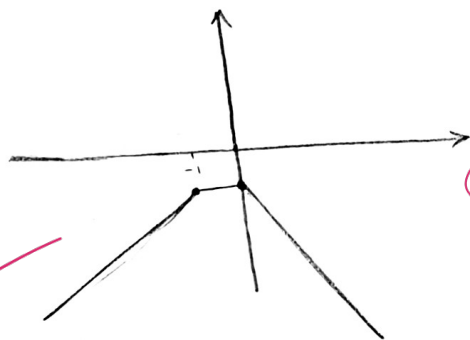


☆ صفر دافعه نفي!

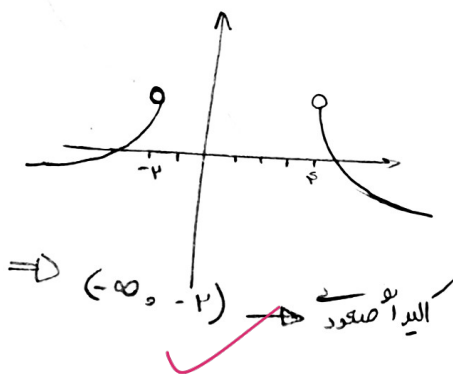
ارفاق نازكينا



$$\Rightarrow (-\infty, 0] \rightarrow \text{محدود} \Rightarrow \max a = 0$$



$$(x+1)(x-1) \Rightarrow \begin{matrix} -1 & 1 \\ + & - \\ \hline & 0 \end{matrix}$$



$$\Rightarrow (-\infty, -1) \rightarrow \text{الحد صفر}$$

$$a^2 - 2 > 1 \rightarrow a > 2 \leq a < 2$$

$$\text{الف) } a^2 - 3 > 0 \Rightarrow a^2 > 3 \Rightarrow a > \sqrt{3} \rightarrow a \in (-\infty, -\sqrt{3}) \cup (\sqrt{3}, +\infty)$$

$$\text{ب) } a^2 - 3 \geq 0 \Rightarrow a^2 \geq 3 \Rightarrow a \geq \sqrt{3} \rightarrow a \in (-\infty, -\sqrt{3}] \cup [\sqrt{3}, +\infty)$$

$$a^2 - 3 < 0 \rightarrow a = \pm \sqrt{3}, \quad a \geq 2 \leq a \leq -2$$

