

نام و نام خانوادگی: آملین عظیمی

شماره: ۴

$$f(-n) - n f(n) = r|n| + 1 \xrightarrow{x=1-n}$$

$$n f(-n) + f(n) = r|n| + 1$$

$$\begin{cases} -nf(-n) + n^r f(n) = -r|n| - 1 \\ n f(-n) + f(n) = r|n| + 1 \end{cases}$$

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

$$f(n) = \frac{r(1-n)|n| + 1 - r}{n^r + 1} = \frac{(1-n)(r|n| + 1)}{n^r + 1}$$

$$f(n) = \frac{(r - rn)|n| + 1 - r}{n^r + 1}$$

$$f(n) + f(1) = n^r - rn + r \xrightarrow{n=1} r f(1) = r$$

$$f(1) = r$$

$$\sim f(n) = n^r - rn + r$$

$$f(n) = n^r - rn + r$$

$$y = \frac{n^r + n + r}{n - 1} \rightarrow y: \text{دولت} = n^r + n + r = y n - y$$

$$n^r + (1-y)n + r + y = 0 \rightarrow n = \frac{-(1-y) \pm \sqrt{\Delta}}{r}$$

$$\Delta \geq 0 \rightarrow (1-y)^2 - 4r(y+r) \geq 0$$

$$y^2 - 2y + 1 - 4ry - 4r \geq 0$$

$$y^2 - 4y - 4r \geq 0 \rightarrow (y - 2)^2 \geq 4r + 3$$

$$R_f: (-\infty, -1] \cup [2, +\infty)$$

$$\text{الف)} y = r n^r - n + 1 \rightarrow y_s \left| \frac{-\Delta}{2a} = \frac{-(r-1)}{r} = \frac{-1}{r}$$

$$R_f: \left[\frac{-1}{r}, +\infty \right)$$

$$\Rightarrow y = \sqrt{-n^r + 4n - 2} \rightarrow y_s: \frac{-\Delta}{2a} = \frac{-(4r-1)}{r} = \frac{1-4r}{r}$$

$$\sqrt{(-\infty, 2]} = \left[\left[\frac{1-4r}{r}, 2 \right], R_f \right]$$

$$\text{ب)} y = \sqrt{\frac{n^r - n^r + 4n + 1}{r}}, \sqrt{r} = \left[\left[\frac{1}{r}, +\infty \right) \right]$$

$$\Rightarrow y = \sqrt{\frac{n^r - 4n^r + 4n + 2}{r}} \rightarrow y: R_f$$

$$R_f: \mathbb{R}$$

$$\text{الف)} y = \frac{n+1}{n-1} \rightarrow R - \left\{ \frac{a}{c} \right\} = R_f = \left[R - \left\{ \frac{a}{c} \right\} \right]$$

$$\Rightarrow y = \sqrt{\frac{n+1}{n-1}} \rightarrow \sqrt{R - \left\{ \frac{a}{c} \right\}}$$

$$\rightarrow R_f: \left[\frac{1}{r}, +\infty \right) - \left\{ \frac{a}{c} \right\}$$

$$\text{ب)} y = \frac{n^{r+1}}{\sqrt{n^r + r}} = \sqrt{n^r + r} + \frac{1}{\sqrt{n^r + r}} \Rightarrow \frac{1}{\sqrt{n^r + r}} = \frac{1}{\sqrt{r}} = \frac{1}{r}$$

$$R_f: \left[\frac{1}{r}, +\infty \right)$$

$$\Rightarrow y = \frac{n^r + 1}{n^r + r} = \frac{1}{n^r + r} = \frac{1}{n^r + r}$$

$$\rightarrow R_f: \left[\frac{1}{r}, +\infty \right) \cap \left[\frac{1}{r}, +\infty \right)$$

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

مشتق

$$(x^2 - 1)(y^2 + c) = y(x^2 - 1) \rightarrow x = \frac{\sqrt{c}}{y(y-c)}$$

$$y \neq 1$$

$$-c(y-1)(y+1) > 0 \rightarrow (y-1)(y+1) > 0 \rightarrow y < -1 \text{ or } y > 1$$

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

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$$y = -c \rightarrow y = 3$$

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

$$f(x) = \frac{2 \sin x + c}{\sin x - 1}$$

$$\sin x = 1 \rightarrow y = \frac{2}{-1} = -2$$

$$\sin x = -1 \rightarrow y = \frac{2}{-2} = -1$$

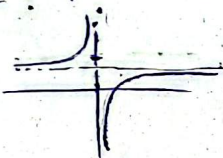
خرج صفر شود

$$R_f: [-2, -1]$$

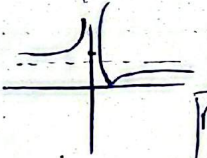
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$$y = \left| \frac{x-1}{x} \right|$$

$$\frac{x-1}{x}$$



$$\left| \frac{x-1}{x} \right|$$



$$R_f: [0, +\infty)$$

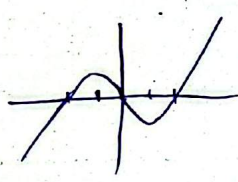
$$y = \sqrt{\frac{9x-18}{x-1}} = \sqrt{\frac{9(x-2)}{x-1}}$$

$$R_f: [2, +\infty)$$

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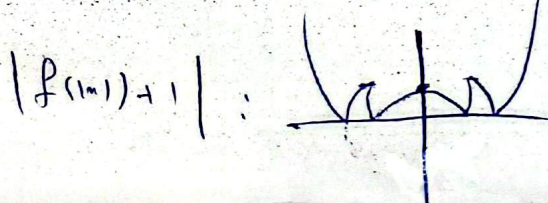
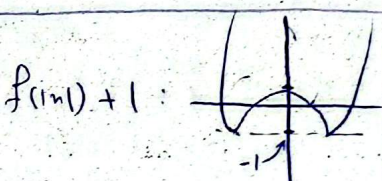
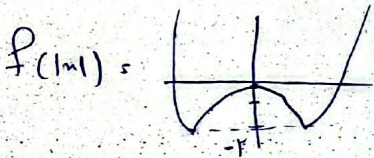
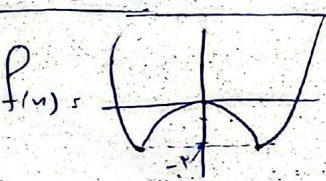
$$y = n|x| - 2n$$

$$x^2 - 2x | n^2 - 2n$$



$$R_f: \mathbb{R}$$

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