

نام و نام خانوادگی: پاسخنامه تشریحی تکلیف شماره کلاس

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

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

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

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

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$$f(n) + f(0) = n^2 - 2n + 9 \rightarrow f(0) + f(0) = 9 \rightarrow f(0) = 9/2 \rightarrow f(n) = n^2 - 2n + 9/2$$

$$f(n) = n^2 - 2n + 9/2$$

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$$y^2 - y = n^2 + n + 2 \rightarrow n^2 + (1-y)n + 2-y = 0 \xrightarrow{\Delta} n = \frac{(y-1) \pm \sqrt{(1-y)^2 - 4(2-y)}}{2}$$

$$\Delta \geq 0 \rightarrow y^2 - 2y + 1 - 4 + 4y \geq 0 \rightarrow y^2 - 2y - 3 \geq 0 \rightarrow (y+1)(y-3) \geq 0$$

$$\frac{-1}{+} \quad \frac{3}{-} \rightarrow R_f = (-\infty, -1] \cup [3, +\infty)$$

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$$\text{الف)} \rightarrow \Delta > 0 \rightarrow y > 2 \rightarrow n_{\min} = \frac{2}{y} \rightarrow y_2 = \frac{1}{\lambda} \rightarrow R_f = \left[\frac{2}{\lambda}, +\infty \right)$$

$$\text{ب)} \rightarrow n_2 = 3 \rightarrow y_2 = 3 \rightarrow R_f = (-\infty, 3] = [0, 3]$$

$$\text{ج)} \rightarrow R_f = \sqrt{R} = [0, +\infty)$$

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$$\text{د)} \rightarrow -\infty < n^2 - 4n^2 + 4n + 4 < +\infty \rightarrow \log \rightarrow 0 < n^2 - 4n^2 + 4n + 4 < +\infty \rightarrow R_{\log(n^2 - 4n^2 + 4n + 4)} = (-\infty, +\infty) = R$$

$$\text{الف)} R = R - \{\text{مکاتبه انقی}\} \rightarrow R_f = R - \left\{ \frac{3}{2} \right\}$$

$$\text{ب)} R = \sqrt{R - \left\{ \frac{9}{2} \right\}} = [0, +\infty) - \left\{ \frac{3}{2} \right\}$$

$$\text{ج)} \begin{matrix} n_{\min} \geq 0 \rightarrow y = \frac{1}{\sqrt{3}} \\ n_{\max} \leq +\infty \rightarrow y \geq +\infty \end{matrix} \rightarrow R = \left[\frac{1}{\sqrt{3}}, +\infty \right)$$

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$$\text{د)} \xrightarrow{\pm 1} n^2 + 1 + \frac{1}{n^2 + 1} \xrightarrow{a + \frac{1}{a}} a_{\min} = 2 \rightarrow R = \left[\frac{1}{2}, +\infty \right)$$

$$① x^2 y - y^2 x^2 + x^2 - y^2 (y=x^2) x^2 + x^2 + y \rightarrow x^2 \pm \sqrt{\frac{x^2 + y}{y - x^2}} \geq 0$$

$$\frac{-x^2}{+0} - \frac{x^2}{+0} \rightarrow R = (-\infty, -x^2] \cup (x^2, +\infty)$$

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$$\begin{aligned} x^2 \lim_{x \rightarrow 0} &\rightarrow y = -x^2 \\ x^2 \lim_{x \rightarrow +\infty} &\rightarrow y = +x^2 \end{aligned} \left\} \begin{array}{l} \text{منحنى مفتوح} \\ R = (-\infty, -x^2] \cup (x^2, +\infty) \end{array} \right.$$

$$\sin x = -1 \rightarrow f(x) = \frac{1}{x} \quad \sin x = 1 \rightarrow f(x) = -x$$

$$\text{منحنى مغلق} \rightarrow R = [-x^2, -\frac{1}{x}]$$

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$$\text{الف) } \left| \frac{x-1}{x^n} \right| \rightarrow R = R - \left\{ \frac{x}{x} \right\} \rightarrow R_f = [0, +\infty) - \left\{ \frac{x}{x} \right\}$$

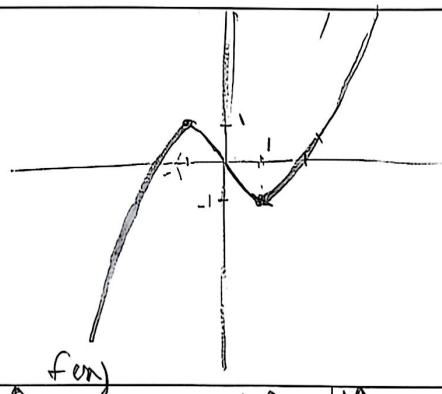
$$\rightarrow \sqrt{\frac{9x-18}{x^n-1}} = \sqrt{\frac{9(x-2)}{x^n-1}} = \sqrt{\frac{9}{x}} \geq \frac{x}{x} \rightarrow R = \left\{ \frac{x}{x} \right\}$$

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$$x \geq 0 \rightarrow y = x^2 - 2x$$

$$x \leq 0 \rightarrow y = -x^2 - 2x$$

$$R_f = (-\infty, +\infty)$$



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