

$$\left. \begin{aligned} f(m) - a f(-m) &= 2|m| + 1 \xrightarrow{\times 2} 2f(m) - 2a f(-m) = 2|m| + 2a \\ f(m) + a f(-m) &= 2|-m| + 1 = 2|m| + 1 \end{aligned} \right\} \xrightarrow{\text{تفریق}}$$

$$f(m) + a f(-m) - a f(-m) + a^2 f(m) = 2|m| + 1 - 2|m| - a$$

$$f(m) + a^2 f(m) = 2|m| - 2|m| - a + 1$$

$$f(m)(1 + a^2) = (2|m| + 1)(1 - a) \Rightarrow f(m) = \frac{(2|m| + 1)(1 - a)}{1 + a^2}$$

$$a=0 \rightarrow f(0) + f(0) = 1 \rightarrow f(0) = \frac{1}{2}$$

$$\Rightarrow f(m) = a^2 - 3a + 3 \rightarrow f(m^2) = a^2 - 3a^2 + 3$$

$$y_m - y = m^2 + m + 2 \rightarrow m^2 + m + 2 - y_m + y = 0 \rightarrow m^2 + (1 - y)m + y + 2 = 0$$

$$m = \frac{-(1-y) \pm \sqrt{(1-y)^2 - 4(y+2)}}{2} \sim \Delta \geq 0 \rightarrow y^2 - 2y + 1 - 4y - 8 \geq 0$$

$$\rightarrow y^2 - 6y - 7 \geq 0 \quad \frac{-1}{+} \frac{7}{-} \Rightarrow R_f: (-\infty, -1] \cup [7, +\infty)$$

$$(y+1)(y-7) \geq 0$$

الف) $\rightarrow a = \frac{2}{3} \rightarrow 2\left(\frac{2}{3}\right)^2 - 2\left(\frac{2}{3}\right) + 1 = \frac{14}{9} \rightarrow R_f: \left[-\frac{14}{9}, +\infty\right)$

ب) $\rightarrow a = \frac{-9}{-4} = \frac{9}{4} \rightarrow -9 + 18 - 2 = 7 \Rightarrow \sqrt{7} \rightarrow R_f: [0, 2]$

ج) $\sqrt{(-\infty, +\infty)} \rightarrow R_f: [0, +\infty)$

د) $f_y(-\infty, +\infty) \rightarrow f_y(0, +\infty) \rightarrow R_f: (-\infty, +\infty)$

الف) $\rightarrow R: \left\{\frac{a}{c}\right\} \Rightarrow R_f: \mathbb{R} - \left\{\frac{3}{2}\right\}$

ب) $\sqrt{18 - \{4\}} \rightarrow R_f: [0, +\infty) - \{2\}$

ج) $\frac{a^2 + 3}{\sqrt{a^2 + 3}} = \sqrt{a^2 + 3} + \frac{1}{\sqrt{a^2 + 3}} \rightarrow R_f: \left[\frac{4\sqrt{3}}{3}, +\infty\right)$

د) $a^2 + 2 + \frac{1}{a^2 + 2} - 2 \rightarrow R_f: \left[\frac{1}{2}, +\infty\right)$

$$\text{دایره اولی} \Rightarrow y_{n^2} - y = 3n^2 + \varepsilon \rightarrow y_{n^2} - 3n^2 = y + \varepsilon \rightarrow n^2 = \frac{y + \varepsilon}{y - 3}$$

$$\Rightarrow \frac{y + \varepsilon}{y - 3} > 0 \quad \frac{-3}{+ \quad - \quad -} = R_f: (-\infty, -\varepsilon] \cup (3, +\infty)$$

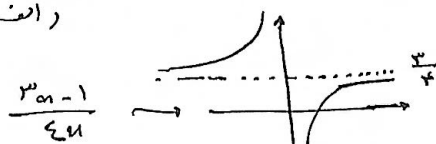
$$\text{تذکره: } n^2 < 0 \Rightarrow \frac{3}{\infty} = 3 \quad \frac{\varepsilon}{-1} = -\varepsilon \quad \xrightarrow{\text{خرج منفی شود}} R_f: (-\infty, -\varepsilon] \cup (3, +\infty)$$

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$$\frac{y_{2n+1} + \frac{1}{2}}{y_{2n+1} - 3} < \begin{cases} x_n = 1 \rightarrow \frac{y + \varepsilon}{1 - 3}, -3 \\ y_n = -1 \rightarrow \frac{-y + \varepsilon}{-1 - 3}, -\frac{1}{4} \end{cases} \xrightarrow{\text{خرج منفی شود}} [-3, -\frac{1}{4}]$$

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دایره

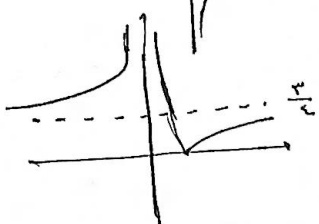


$$\sqrt{\frac{4(n-2)}{5(n-2)}} \xrightarrow{n \neq 2} \sqrt{\frac{4}{5}} = \frac{2}{\sqrt{5}}$$

$$\Rightarrow R_f: \left\{ \frac{2}{\sqrt{5}} \right\}$$

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فرد حلق



$$\sim R_f: (0, +\infty)$$

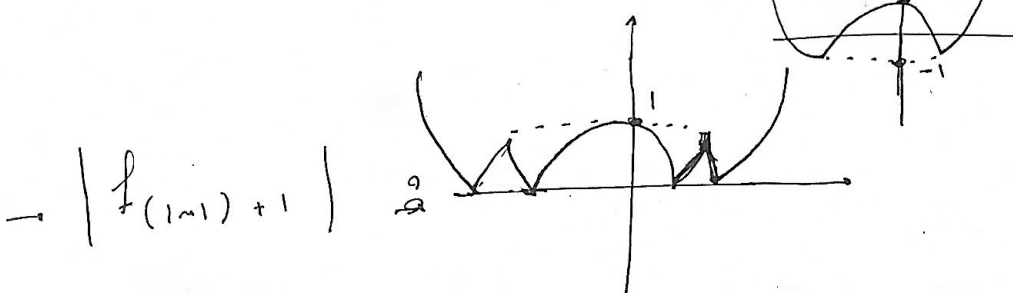
$$n > 0 \rightarrow n^2 - 2n = n(n-2) \rightarrow n \in [1, 2]$$

$$n < 0 \rightarrow -n^2 - 2n = -(n)(n+2) \rightarrow n \in [-2, -1]$$

$$\sim R_f: (-\infty, +\infty)$$

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$$f(|n|) = f(n) \sim f(|n|) + 1$$



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