

٢٥ آفريق:

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

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

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

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

$$2f(1) = 4 \quad f(1) = 2 \quad f(n) = n^2 - 2n + 2$$

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

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

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

$$\begin{aligned} y^2 - 2y + 1 - y - 1 &\geq 0 \\ y^2 - 3y &\geq 0 \\ (y-3)(y) &\geq 0 \\ \frac{-1}{+} &\frac{+}{-} \end{aligned}$$

$$R_f = (-\infty, -1] \cup [3, +\infty) \checkmark$$

$$b) \quad y = 2n^2 - \omega n + 1$$

$$\Delta \geq 0 \quad \left| \frac{\omega}{2} \right| \quad \frac{\omega^2}{4} - \frac{2\omega}{1} + 1 = \frac{\omega^2}{4}$$

$$R_f = [-\frac{1}{2}, +\infty) \checkmark$$

$$c) \quad y = \sqrt{-n^2 + 4n - 6}$$

$$\Delta \geq 0 \quad \left| \frac{4}{2} \right| \quad \rightarrow (+\infty, 4] \xrightarrow{\checkmark} [0, 4] \checkmark$$

$$2) \quad y = \sqrt{n^2 - 2n^2 + (2n+1)} \rightarrow \mathbb{R} \xrightarrow{\checkmark} [0, +\infty) \checkmark$$

$$d) \quad y = (x^2 - 4n^2 + \sqrt{n-1}) \quad R_f = \mathbb{R} \checkmark$$

$$e) \quad R_f = \mathbb{R} - \left\{ \frac{2}{3} \right\} \quad \mathbb{R} - \left\{ \frac{2}{3} \right\} \checkmark$$

$$f) \quad \mathbb{R} - \{1\} \xrightarrow{\checkmark} [0, +\infty) - \{1\} \checkmark$$

$$2) \quad \frac{n^2 + n + 1}{\sqrt{n^2 + 3}} = \sqrt{n^2 + 3} + \frac{1}{\sqrt{n^2 + 3}} \xrightarrow{\Delta = 3} \sqrt{3} + \frac{1}{\sqrt{3}}, \quad \frac{3+1}{\sqrt{3}} \checkmark, \quad \frac{3}{\sqrt{3}} \checkmark \quad \text{درست بنویس}$$

$$R_f = \left[\frac{4\sqrt{3}}{3}, +\infty \right) \checkmark$$

$$ج) \quad n^2 + 1 + \frac{1}{n^2 + 1} - 1 \rightarrow \left[\frac{1}{n^2} + \infty \right] \xrightarrow{-1} \left[\frac{1}{n^2} + \infty \right] \checkmark$$

$$y = n^2 - 1 = n^2 + 1 \quad (n-1)n^2 + 1 + y = \dots \quad n^2 = \frac{-(1+y)}{n-1} = \frac{y+1}{y-1}$$

(2) - 6

$$n = \pm \sqrt{\frac{y+1}{y-1}}$$

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

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

$$\frac{n^2 + 1}{n^2 - 1} \quad \begin{matrix} \text{max} = \infty \\ \text{min} = -1 \end{matrix} \quad n \text{ (عدد)}$$

مخرج منفرد شود

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

$$\frac{2 \sin n + 1}{\sin n - 1}$$

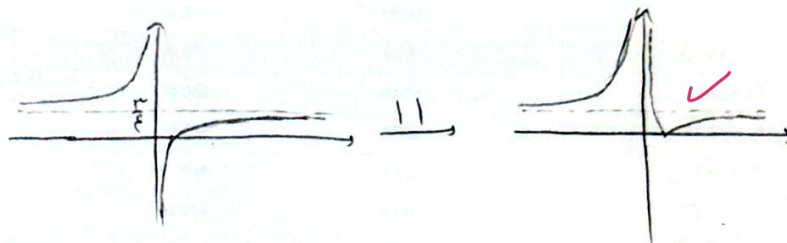
$$\begin{matrix} \text{max} = 1 & \frac{3}{-1} = -3 \\ \text{min} = -1 & \frac{-1}{-1} = 1 \end{matrix}$$

مخرج منفرد شود

$$R_f = [-3, -\frac{1}{1}] \checkmark$$

(2) - 7

$$الف) \quad y = \left| \frac{n-1}{n} \right|$$



$$R_f = \mathbb{R} \checkmark$$

(2) - 8

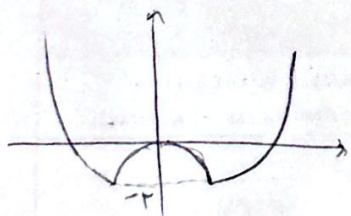
$$ب) \quad y = \sqrt{\frac{n-1}{n-1}} = \sqrt{\frac{1}{1}} = 1 \quad R_f = \left\{ \frac{1}{1} \right\} \checkmark \text{ - مجموعه ثابت}$$

$$y = \begin{cases} n^2 - 2n & n \geq 0 \\ -n^2 - 2n & n < 0 \end{cases}$$



$$R_f = \mathbb{R} \checkmark$$

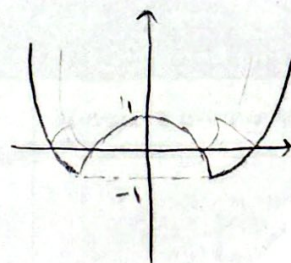
(2) - 9



|n|

دفعات شکل آقبل
نزدیکتر و راسی
مستقیم است

+1



(2) - 10

