

۱) $f(-x) - x f(x) = 2|x| + 1$ $\times x$ $\Rightarrow x f(-x) - x^2 f(x) = x(2|x| + 1)$
 $\times (-x)$ $\Rightarrow x f(x) + x^2 f(-x) = 2|x| + 1$
 (۳) $\ominus, \oplus$: $[x f(-x) - x^2 f(x)] - [x f(x) + x^2 f(-x)]$
 $-x^2 f(x) - f(x) = 2|x| + 1 - 2|x| - 1 \rightarrow f(x) = \frac{(1-x)(2|x|+1)}{x^2+1}$

$x=0 \rightarrow f(0) + f(0) = 4 \rightarrow f(0) = 2$ $f(x) = x^2 - 3x + 2$
 $f(x^2) = x^4 - 3x^2 + 2$

$y = \frac{x^2 + x + 2}{x-1} \rightarrow xy - y = x^2 + x + 2 \rightarrow x^2 + x(1-y) + y + 2 = 0$
 $x = \frac{-1+y \pm \sqrt{(1-y)^2 - 4(y+2)}}{2} \quad (1-y)^2 - 4(y+2) \geq 0 \rightarrow y^2 - 4y - 7 \geq 0$
 $+ \quad - \quad + \quad - \quad +$ $R = (-\infty, -1] \cup [7, +\infty)$

الف) $x_{\min} = -\frac{b}{2a} = \frac{\infty}{F} \rightarrow y_{\min} = \frac{-14}{\lambda} \quad R = [-\frac{14}{\lambda}, +\infty)$
 ب) $\sqrt{-x^2 + 4x - 5} \rightarrow x_{\max} = -\frac{b}{2a} = \frac{-4}{-2} = 2 \quad R = \sqrt{[-4, 4]} = [0, 2]$
 ج) $\sqrt{x^4 - 3x^2 + 2x + 1} \rightarrow R = [0, +\infty)$
 د) $y = \log(x^2 - 4x^2 + 7x + 4) \quad R = \mathbb{R}$

الف) $R = \left\{ \frac{a}{c} \right\} = R = R - \left\{ \frac{4}{F} \right\}$
 ب) $y = \frac{x+1}{x-2} \rightarrow R = \mathbb{R} - \left\{ \frac{1}{2} \right\} \rightarrow \sqrt{\frac{x+1}{x-2}} = [0, +\infty) - \left\{ \frac{1}{2} \right\}$
 ج) $\frac{x^2+3+1}{\sqrt{x^2+3}} = \sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}} \quad R = \left[\frac{2}{\sqrt{3}}, +\infty \right)$
 د) $x^2 + 4 + \frac{1}{x^2 + 4} \rightarrow \min_{x \in \mathbb{R}} \left[4 + \frac{1}{x^2 + 4} \right] = \left[\frac{14}{5}, +\infty \right) - \frac{4}{5} = \left[\frac{9}{5}, +\infty \right)$

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

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

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

$$y = \frac{x^2 + 1}{x^2 - 1} \quad \begin{array}{l} \text{می توانیم} \\ \text{منقسم کرد} \end{array} \quad R = (-\infty, -1] \cup (1, +\infty)$$

$$y = \frac{1 \sin x + 1}{\sin x - 1} \quad \begin{array}{l} \sin x = -1 \quad \frac{1}{-1} = -1 \\ \sin x = 1 \quad \frac{1}{-1} = -1 \end{array} \quad R = [-1, -\frac{1}{1}]$$

$$\text{الف) } y = \left| \frac{x^2 - 1}{x} \right| \quad R = [0, +\infty) \quad \begin{array}{l} \text{جواب در مطلق} \\ \geq 0 \end{array}$$

$$\text{ب) } \sqrt{\frac{9(x-1)}{x(x-1)}} = \sqrt{\frac{9}{x}} = \frac{3}{\sqrt{x}} \rightarrow R = \left\{ \frac{3}{\sqrt{x}} \right\}$$

