

۱۹,۵

$$\begin{aligned} -x &\rightarrow f(x) + x f(-x) = -2x + 1 \\ x &\rightarrow f(-x) - x f(x) = 2x + 1 \end{aligned} \quad \left\{ \begin{aligned} + &\rightarrow (1-x) f(x) + (1+x) f(-x) = 1 \\ - &\rightarrow (1+x) f(x) + (x-1) f(-x) = -2x \end{aligned} \right.$$

$$\begin{aligned} x f(-x) - x^2 f(x) &= x(2x+1) \\ f(x) + x(f(-x)) &= 2|x|+1 = 2|x|+1 \end{aligned}$$

$$\rightarrow -f(x)(x^2+1) = 2|x|(x-1) + x - 1 \rightarrow \boxed{f(x) = \frac{-(x-1)/(x^2+1)}{x^2+1}}$$

$$x=0 \rightarrow 2f(0)=4 \rightarrow \boxed{f(0)=2}$$

$$x=x^2 \rightarrow f(x^2)+2 = x^2 - 2x^2 + 4 \rightarrow \boxed{f(x^2) = x^2 - 2x^2 + 4}$$

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

~~$\mathbb{R} \setminus \mathbb{R}$~~

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

$$\rightarrow \boxed{R_y = (-\infty, -1] \cup [2, +\infty)}$$

$$x = \frac{y-1 \pm \sqrt{y^2-4y-4}}{2} \Delta \geq 0 \rightarrow y^2-4y-4 \geq 0 \quad \frac{-1}{2} \pm \frac{\sqrt{17}}{2}$$

الف)  $y = 2(x - \frac{\sqrt{5}}{2})^2 - \frac{5}{2} + 1 \rightarrow f' = \frac{1}{\sqrt{2}}(x + \frac{\sqrt{2}}{2}) + \frac{1}{2} \rightarrow D_{f'} = R_{f'} = x + \frac{\sqrt{2}}{2} > \frac{1}{\sqrt{2}}$

ب)  $\frac{-1}{f_x} = \frac{-(2x-1)}{-1} = f \quad R_f = [0, 2]$

ج)  $R = R^+ \cup \{0\} = [0, +\infty)$

د)  $R = R^+ = (0, +\infty)$   $\log R = \log(0, +\infty) = (-\infty, +\infty)$  جلوی نظایم همیشه هسته!

الف)  $2xy - 2y = 2x+1 \rightarrow x = \frac{y+1}{2y-2} \rightarrow y = \frac{y+1}{2x-2} \quad R_y = D_{y'} = R - \{\frac{1}{2}\}$

ب)  $y^2 = \frac{x+1}{x-2} \rightarrow xy^2 - 2y^2 = x+1 \rightarrow x = \frac{y^2+1}{y^2-2} \rightarrow y = \frac{y^2+1}{x^2-2} \quad R_y = D_{y'} = R^+ - \{\pm\sqrt{2}\}$

ج)  $= \sqrt{x^2+2} + \frac{1}{\sqrt{x^2+2}} \quad \min = \sqrt{2} \rightarrow R = [R - (-\sqrt{2}, \sqrt{2})] \rightarrow R - [\frac{\sqrt{2}}{2}, +\infty) \quad = [0, 2) \cup (2, +\infty)$

د)  $= x^2 + \frac{1}{x^2+2} - \frac{1}{2} \rightarrow R = (-\infty, +\infty) \rightarrow R = (-\infty, -1] \cup [1, +\infty)$

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دو سر  $x^2$  به  $+\infty$  و  $-\infty$  می رود.  $R = R - (-\infty, \infty) = (-\infty, -\infty) \cup [\infty, +\infty)$   مخرج می تواند 0 شود.

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$$y^r = \frac{9n - 1n}{-1 + 5X} \rightarrow \cancel{n} = \frac{\cancel{1}y^r - 1n}{5y^r - 9}$$

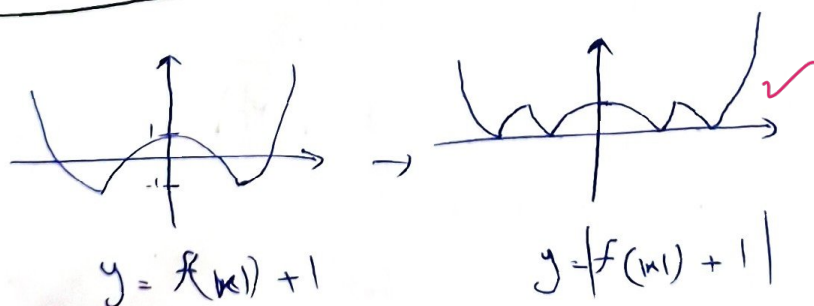
~~$$x = \frac{\pm \Delta y^2 - 1A}{x y^2 - 9} \rightarrow x y^2 - 9 = 10$$~~

$\rightarrow y \neq \pm \frac{1}{r}$   
 $R = R - \left\{ \pm \frac{1}{r} \right\}$   
 $R = \left\{ \frac{1}{r} \right\}$

Q



②



$$y = f(x) + 1$$

$$y = |f(n) + 1|$$

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