

تالیف

نام خانوادگی

امید علی میرزائی

$$f(x) = \sqrt{\frac{x-1}{x}} - \frac{x}{x-1} \rightarrow \frac{((x-1)(x-1)) - x^2}{x^2 - x} \geq 0 \quad 1$$

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

$$\rightarrow \frac{x| \begin{smallmatrix} 0 \\ + \end{smallmatrix} }{+ \begin{smallmatrix} 0 \\ \end{smallmatrix} } - \frac{1}{\begin{smallmatrix} 0 \\ - \end{smallmatrix} } + \frac{1}{\begin{smallmatrix} 0 \\ + \end{smallmatrix} } \rightarrow \text{Def} = (-\infty, 0) \cup [\frac{1}{2}, 1)$$

$$f(x) = \frac{\frac{1}{x+1} - \frac{2}{x}}{\frac{3}{x-1} + \frac{1}{x+2}} \rightarrow x \neq 0, x \neq -1, x \neq 1, x \neq -2$$

$$\frac{3}{x-1} + \frac{1}{x+2} \neq 0 \rightarrow \frac{3x+9+x-1}{(x-1)(x+2)} \neq 0$$

$$\rightarrow \frac{4x+8}{(x-1)(x+2)} \neq 0 \rightarrow \frac{4(x+2)}{(x-1)(x+2)} \neq 0 \rightarrow x \neq -2$$

$$\rightarrow \text{Def} = \mathbb{R} - \{0, -1, 1, -2, -\frac{5}{4}\}$$

الف) $f(x) = \sqrt{\left[\left(\frac{1}{x}\right)^n - 9\right][x^2 - x^n]}$

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$$\rightarrow \left[\left(\frac{1}{x}\right)^n - 9\right][x^2 - x^n] > 0 \rightarrow \left(\frac{1}{x}\right)^n > 9 \rightarrow x < -\frac{1}{3}$$

$$x^2 - x^n > 0 \rightarrow x^n \leq \frac{x^2}{x^2} \rightarrow x \leq \frac{1}{x}$$

$$\rightarrow Df: (-\infty, -\frac{1}{3}] \cup \left[\frac{1}{3}, +\infty\right)$$

ب) $\sqrt[n]{x-1} + \sqrt{y+1} \leq 3 \rightarrow \sqrt{y+1} \leq 3 - \sqrt[n]{x-1}$

$$\rightarrow 3 - \sqrt[n]{x-1} \geq 0 \rightarrow x-1 \geq 0 \rightarrow \sqrt[n]{x-1} \leq 3 \rightarrow x-1 \leq 27$$

$$\rightarrow x \leq 28 \rightarrow Df: [1, 28]$$

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

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$$\sqrt{x^2-1} + 1 \neq 0 \rightarrow \text{مقامه در ٥-١}$$

$$x^2 - 1 > 0 \rightarrow x^2 > 1 \rightarrow x > 1, x < -1$$

$$\rightarrow Df: (-\infty, -1) \cup (1, +\infty)$$

$$\underline{u = -\frac{1}{\Delta}} \text{ then } s_0 \rightarrow 1 - \frac{1}{\Delta} a - \frac{1}{\Delta} s_0 \rightarrow -1 - \frac{1}{\Delta} a s_0 \quad \text{---}$$

$$\rightarrow a s_0 - 0/\Delta$$

$$\rightarrow 1 + \left(-\frac{1}{\Delta} \times b\right) - b^2 s_0 \rightarrow -\left(b^2 + 0/\Delta b - 1\right) s_0$$

$$\rightarrow -(b + 1/\Delta)(b - 1/\Delta) s_0 \rightarrow b - \frac{1}{\Delta} \text{ (1/\Delta)}$$

$$\rightarrow 1/\Delta + (-0/\Delta) = \textcircled{1} \quad \text{--- } a + b \quad \textcircled{2}$$

Δ - برای $x \geq 1$ $\sqrt{x} - 2 - x \leq x - 2 \geq 0$
 جوابی دهه

برای $x < 1$ $x + 3 - x \leq x + 3 \geq 0 \rightarrow x \geq -3$

$\rightarrow Df = [-3, +\infty)$

$$f\left(\frac{\sqrt{r}}{r} + 1\right) = f\left(\frac{r + \sqrt{r}}{r}\right)$$

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$$f(x) = \ln\left(x - \frac{1}{x}\right) \rightarrow f\left(\frac{r + \sqrt{r}}{r}\right) = \ln\left((r + \sqrt{r})\left(\frac{\sqrt{r} - 1}{r}\right)\right)$$

$$= \frac{r - 1}{r} = \frac{1}{r} \quad \text{Q.E.D.}$$

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$$f(a) = \frac{a+1}{a-1} \rightarrow f(f(a)) = \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = a \quad -V$$

$$\rightarrow \frac{\frac{a+1+a-1}{a-1}}{\frac{a+1-a+1}{a-1}} = \frac{2a}{2} = a \rightarrow 2a \neq a \rightarrow a \in \mathbb{R} - \{1\} \quad \text{P}$$

~~f(a) = a^r~~ $g(a) = \sqrt{a^r - 1}$ -A

$$f(g(a)) = a^r - 1 - \sqrt{a^r - 1} \rightarrow \sqrt{a^r - 1} + t^r - t + t^r s_0$$

$$\rightarrow (t - 1)^r s_0 \rightarrow t^r s_0 - \sqrt{a^r - 1} s_0 - a^r s_0 \rightarrow a^r s_0$$

$$-a \leq \pm \sqrt{\Delta} \quad \checkmark \quad \text{P}$$

$$f(x) \cdot f(1+x) = 1 - \Delta + 9 = 7 \quad -9$$

$$f(-x) = f(-4+x) = 49 + 36 + 9 = 94$$

$$f(x) \times f(-x) = 7 \times 94 = 658 \quad \text{P}$$

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$$r \cos^2 \theta + \Delta \cos \theta = r_1 \Delta \xrightarrow{\cos \theta = t} r t^2 + \Delta t - r_1 \Delta = 0 \quad \text{--- 1.}$$

$$\rightarrow r t^2 + \Delta t - r_1 \Delta = 0 \rightarrow (t + V)(t - r) = 0 \rightarrow t < \frac{-\Delta}{r} \times \frac{1}{r} V$$

$$\rightarrow \cos \theta = \frac{1}{r} \rightarrow \tan^2 \theta = \frac{1 - \cos^2 \theta}{\cos^2 \theta} = \frac{1 - \frac{1}{r^2}}{\frac{1}{r^2}}$$

$$\rightarrow f(r, \Delta) = r$$