

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

$x \neq 1$ و $x \neq -2$ و $x \neq -1$ و $x \neq 0$ $D = (-\infty, 0) \cup \left[\frac{1}{2}, 1\right)$ $x \geq \frac{1}{2}$ ①

$\frac{x^2(x+2) + (x-1)}{(x-1)(x+2)} \rightarrow \frac{x^3 + 2x^2 + x - 1}{(x-1)(x+2)} \rightarrow D = R - \{0, -2, -1\}$

$\left(\frac{1}{x}\right)^x - 1 \geq 0 \rightarrow x = -2$ $\left\{ \begin{array}{l} x^2 - 4x + 4 = 0 \\ x^2 - 4x + 4 = 0 \end{array} \right. \rightarrow D = (-\infty, -2] + 0 -$

$\sqrt{x-1} + \sqrt{x+1} = 3 \rightarrow \sqrt{x+1} = 3 - \sqrt{x-1} \rightarrow x \geq 1 \rightarrow (3 - \sqrt{x-1})^2 \rightarrow 11 \geq x^2 - 1$ ②

$11 \geq (x^2+1)(x^2-1) \rightarrow -4x < 4 \rightarrow D = (-4, 4) \cup [3, 3]$

$x \geq 1 \rightarrow \sqrt{3-2a} + 4 \geq 0 \rightarrow -2a + 4 \geq 0 \rightarrow -2a \geq -4 \rightarrow 2a \leq 4 \rightarrow a \leq \frac{4}{2}$

$ax^2 + bx + c \rightarrow -2b = \frac{4}{-1} = -4 \rightarrow 2b = 4 \rightarrow b = \frac{4}{2} \rightarrow \frac{4}{2} - 2 = a \rightarrow a = -1$ ④

$x = -2 \rightarrow$ یکی از ریشه ها

$a + b = -1 + \frac{4}{2} = \frac{4}{2} - 1 = 1$

$\log_f(x^2 - x - 2) > 0 \rightarrow (x-2)(x-1) > 0$ $\left. \begin{array}{l} x \neq 1 \\ x \neq 2 \end{array} \right\} \rightarrow (x-2)(x-1) > 1 \rightarrow R$ ③

$D = R - \{1, 2\}$

$\sqrt{f(x) - x} \geq 0 \rightarrow 2x - 2 - x \geq 0 \rightarrow x - 2 \geq 0 \rightarrow x \geq 2$

$\sqrt{f(x) - x} \geq 0 \rightarrow 2x + 3 - x \geq 0 \rightarrow x + 3 \geq 0 \rightarrow x \geq -3$ ⑤

$[-3, 2) \cup [2, +\infty)$

$$f\left(\sin \frac{\pi}{4} + \cos \frac{\pi}{4}\right) = \left(\frac{\sqrt{2}}{2} + 1\right) \left(\frac{\sqrt{2}}{2} + 1\right) = \left(\frac{\sqrt{2}}{2} + 1\right)^2 = f\left(\frac{\sqrt{2}}{2} + 1\right)$$

$$\left(\frac{\sqrt{2}}{2} + 1 + \sqrt{2}\right) \times \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2} + 1 + \sqrt{2} - \sqrt{2} - 1 = -1/0$$

9

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

$$x=a \quad \frac{x+1}{x-1} - 1 \rightarrow \frac{x+1-x+1}{x-1} = \frac{2}{x-1} = x$$

✓

$$D = R - \{1\}$$

$$f(g(a)) = -f \rightarrow \tau^2 - f\tau = -f \rightarrow \tau^2 - f\tau + f = 0 \rightarrow (\tau - f)^2 = 0$$

$$\tau = f \rightarrow \tau = 2 \rightarrow \tau = 2$$

$$f(a)\sqrt{x^2-1} = 2 \rightarrow |x^2-1| = 2 \rightarrow x^2-1 = 2 \rightarrow x^2 = 3 \rightarrow x = \pm\sqrt{3}$$

$$x^2-1 = -2 \rightarrow x^2 = -1 \rightarrow x = \pm i$$

1

$$f(x+y) = x^2 - 2xy + y^2 \rightarrow f(1) = 1 - 2 + 1 = 0 \rightarrow$$

$$f(x) \times f(-x) = 0$$

9

$$(f \cos^2 + a \cos) = \tan^2, \quad f \cos^2 + a \cos = 1/a \rightarrow (f \cos^2 + a \cos - 1/a) = 0$$

$$\cos = \tau \quad \wedge \tau^2 + 1/a \tau - 1/a = 0 \rightarrow (\tau - 1/a)(\tau + 1) = 0$$

$$-1 \leq \cos \leq 1 \quad \cos = \tau = \frac{1}{a} \quad \tau = \frac{1}{a} = -1/a$$

$$\sin^2 = 1 - \cos^2 \rightarrow 1 - \frac{1}{a^2} = \frac{a^2-1}{a^2} \rightarrow \tan^2 = \frac{a^2-1}{1} = a^2 - 1$$

10