$\int_{\cot\frac{\pi}{4}}^{\sqrt{\sin^2 x+1}} = 2 \Rightarrow f(f(\frac{\pi}{2})) = 2$

$2(\frac{1}{2})^2 = \frac{1}{2} \Rightarrow f(\frac{1}{2}) = \sqrt{12} = 2\sqrt{3} \Rightarrow f \circ g(\frac{\pi}{4}) = 2$

$\frac{\sqrt{2}\cdot(1-\sqrt{2})}{-1} = \sqrt{2}-2 \xrightarrow{f(\sqrt{2}-2)} [-\sqrt{2}-1]$

$f(\frac{\pi}{4}) = \frac{\sqrt{2}}{2} \Rightarrow g(\frac{\sqrt{2}}{2}) = \frac{2}{\sqrt{2}} \times \frac{1}{2} = \frac{1}{\sqrt{2}}$

ب) $f \to 4 \to 3$
$2 \to 3 \to 2$
$4 \to 1 \to 4$
$1 \to 0 \to 1$

$\} \to \{(1,4)(2,3)(3,2)(4,1)\}$

ج) $3 \to 0 \to \emptyset$
$4 \to 0 \to \emptyset$
$1 \to 1 \to \emptyset$
$0 \to 1 \to \emptyset$

$\} \to \emptyset$

د) $4 \to 0 \to \emptyset$ $4 \to 0 \to \emptyset$
$1 \to 1 \to \emptyset$ $0 \to 1 \to \emptyset$ $\} \to \emptyset$

ه) $5 \to 4 \to 1$
$2 \to 5 \to 4$
$4 \to 1 \to 0$
$1 \to 0 \to \emptyset$

$\} \to \{(5,1)(4,2)(1,4)\}$

$a = f$
$b = \omega$ $\Big\} \rightarrow (\varepsilon < \omega)$ - ω

$a = \pm 2 \begin{cases} \rightarrow b = 1 \Rightarrow 2x+1 \\ \rightarrow -b = 2 \Rightarrow b = -2 \Rightarrow -x-2 \end{cases}$ - ۶

$2c = 2 \Rightarrow c = \frac{2}{2} \Rightarrow \frac{b}{2} + d = -2 \Rightarrow d = -\frac{12}{2} \Rightarrow \frac{2}{2}x - \frac{12}{2}$

$\Rightarrow \frac{2}{2}(-1) - \frac{12}{2} = \cancel{-7}$

$\frac{2}{2}(-2) - \frac{12}{2} = -\frac{16}{2}$

$x \rightarrow \begin{cases} 0 \\ F \end{cases}$ $x+|x|=-\Rightarrow \mathbb{R}^- \cup \{0\}$ - ۷

$\sqrt{x+|x|} = 2 \Rightarrow x = 1$

$\Rightarrow \mathbb{R} - \{\mathbb{R}^- \cdot \{0\} \cup \{1\}\}$

$\sqrt{1-\sqrt{1-x^2}} + \sqrt{\sqrt{1-x^2}}, \quad -1 \leq x \leq 1$ - ۸

$\sqrt{1-x^2} < 1 \Rightarrow x^2 > 0 \Rightarrow [-1,1]$

$x = \frac{1+2t}{t-2} \Rightarrow \frac{2t-11}{t-2} \Rightarrow f(x) = \frac{11-2x}{x-2}$ - ۹

$f(x) = x(x^2 - 5) \Leftarrow (x+\frac{1}{x})((x+\frac{1}{x})^2 - 2) \Rightarrow$ -۱۰

$f(x) = 1 \Rightarrow x = 1$

$f(x) = 2\sqrt{2} \Rightarrow x = 2$ $\Big\} \rightarrow |2-1| = 1$ -۱۱