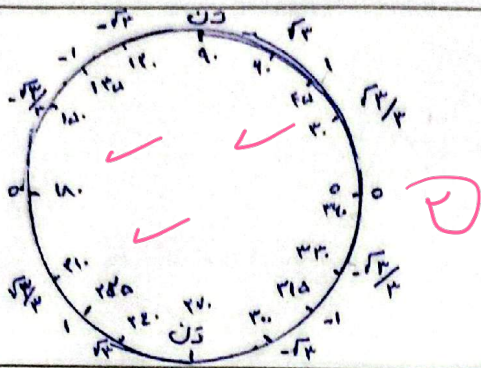




۱) $\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{\pi}{4} = -\frac{\sqrt{2}}{2}$
 $\hookrightarrow \frac{1}{\sqrt{2}} + (-1) + 2(1)$

۲) $\cot \frac{\pi}{4} + 2 \cot \frac{\pi}{4} - 2 \tan \frac{\pi}{4} = \frac{\sqrt{2}}{4}$
 $\hookrightarrow \frac{1}{\sqrt{2}} + 2(\frac{1}{\sqrt{2}}) - 2(1)$

۳) $-\cos \frac{\pi}{4} + \sin \frac{\pi}{4} - 2 \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$
 $\hookrightarrow -(\frac{1}{\sqrt{2}}) + \frac{1}{\sqrt{2}} + (-2)(\frac{1}{\sqrt{2}})$

۴) $\cos(\sin \pi) + \sin(\cos \frac{\pi}{4}) = 2$
 $\cos(0) + \sin(\frac{\sqrt{2}}{2}) = 1 + \sin(\frac{\sqrt{2}}{2})$

$f(x) \begin{cases} x^2 + 2x & x \geq a \\ 2x + a + 2 & x < a \end{cases} \Rightarrow a = x$

$a^2 + 2a = 2a + 2 \Rightarrow a^2 + a - 2 = 0$

$(a+2)(a-1) = 0 \Rightarrow a = \begin{cases} 1 \\ -2 \end{cases}$

$f(x) \begin{cases} x^2 + 2x & x \geq 1 \\ 2x + 2 & x < 1 \end{cases}$

$f(1) = 1 + 2 = 3 = 2 \cdot 1 = 2$

$f(x) \begin{cases} x^2 - b & |x+1| \geq 2 \\ a + 2x & |x+1| < 2 \end{cases} \Rightarrow \begin{cases} x+1 \geq 2 \\ x+1 < 2 \end{cases} \Rightarrow \begin{cases} x \geq 1 \\ x < 1 \end{cases}$

$x = -2 \begin{cases} 11 - b \\ a - 4 \end{cases} \Rightarrow 11 - b = a - 4 \Rightarrow a - b = 15$

۱) $y = \frac{1}{x^2 - 4x} \Rightarrow \frac{1}{x^2(x-4)} \quad \frac{x}{-4} = \frac{x}{0} \Rightarrow D_f = \mathbb{R} - \{0, 4\}$

۲) $y = \frac{1}{x^2 + 4x^2 + 2x + 2} \Rightarrow \frac{1}{2x^2(x+2) + 2(x+2)} \Rightarrow \frac{1}{2(x+2)(x^2+1)}$

$x^2 + 1 \neq 0 \Rightarrow x^2 \neq -1 \Rightarrow x \in \mathbb{R}$

(1) $y = \sqrt{x^2-1} + \sqrt{x-2}$ $x^2-1 \geq 0 \Rightarrow x^2 \geq 1 \Rightarrow \begin{cases} x \geq 1 \\ x \leq -1 \end{cases}$
 $x-2 \geq 0 \Rightarrow x \geq 2$ $\xrightarrow{\cap} D_f = [2, \infty)$

(2) $y = \frac{\sqrt{4-3x}}{\sqrt{x-2}}$ $\begin{cases} 4-3x \geq 0 \Rightarrow 3x \leq 4 \Rightarrow x \leq \frac{4}{3} \\ 4x-2 \geq 0 \Rightarrow 4x \geq 2 \Rightarrow x \geq \frac{1}{2} \end{cases} \xrightarrow{\cap} (\frac{1}{2}, \frac{4}{3}]$

$y = \sqrt{4x-a} + \sqrt{b-2x}$ $D_f = \{x\}$ $\frac{b}{a} = ?$

$\begin{cases} 4x-a \geq 0 \Rightarrow x \geq \frac{a}{4} \\ b-2x \geq 0 \Rightarrow x \leq \frac{b}{2} \end{cases} \Rightarrow D_f = [\frac{a}{4}, \frac{b}{2}] = \{x\} \xrightarrow{\begin{matrix} \frac{a}{4} = \frac{b}{2} \Rightarrow a = 2b \\ \frac{b}{2} = \frac{a}{4} \Rightarrow b = \frac{a}{2} \end{matrix}} \Rightarrow \frac{b}{a} = \frac{\frac{a}{2}}{a} = \frac{1}{2}$

نارین زهراسفینی

(1) $y = \sqrt{\frac{x^2-x-4}{x^2-11x^2+24}}$ $\geq 0 \Rightarrow \begin{cases} (x-2)(x+2) \geq 0 \\ (x^2-4)(x^2-9) \geq 0 \Rightarrow (x-2)(x+2)(x-3)(x+3) \geq 0 \end{cases}$
 $D_f = (-\infty, -3) \cup (-2, 2) \cup (3, \infty)$
 (2) $y = \sqrt{\frac{x^2-2x^2-2x+4}{x^2+2x^2-2x-4}}$ $\geq 0 \Rightarrow \begin{cases} (x-1)(x-2)(x+2) \geq 0 \\ (x+1)(x+2)(x-2) \geq 0 \end{cases}$
 $D_f = (-\infty, -2) \cup (-1, 1) \cup (2, \infty)$

(1) $y = \sqrt{2[x]-x} \Rightarrow 2[x]-x \geq 0 \Rightarrow 2[x] \geq x \Rightarrow [x] \geq \frac{x}{2} \Rightarrow D_f = [2, \infty)$

(2) $y = \sqrt{2[x]-a} \Rightarrow 2[x]-a \geq 0 \Rightarrow 2[x] \geq a \Rightarrow [x] \geq \frac{a}{2} \Rightarrow D_f = [3, \infty)$

(1) $y = \sqrt{\frac{x+1}{|x^2-1|}} + \sqrt{\frac{4}{x^2+2x+2}}$ $\Rightarrow \begin{cases} \frac{x+1}{|x^2-1|} \geq 0 \Rightarrow \begin{cases} x+1 \geq 0 \Rightarrow x \geq -1 \\ |x^2-1| \geq 0 \Rightarrow x \neq \pm 1 \end{cases} \\ \frac{4}{x^2+2x+2} \geq 0 \Rightarrow \begin{cases} 4-x \geq 0 \Rightarrow x \leq 4 \\ (x+1)^2+1 \geq 0 \end{cases} \end{cases} \xrightarrow{\cap} D_f = [-1, 2) \cup (3, 4]$

(2) $y = \sqrt{[x]-x} + \sqrt{2-[x]} \Rightarrow \begin{cases} [x]-x \geq 0 \Rightarrow [x] \geq x \Rightarrow (-\infty, 1) \\ 2-[x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow (-\infty, 2] \end{cases} \xrightarrow{\cap} \emptyset$