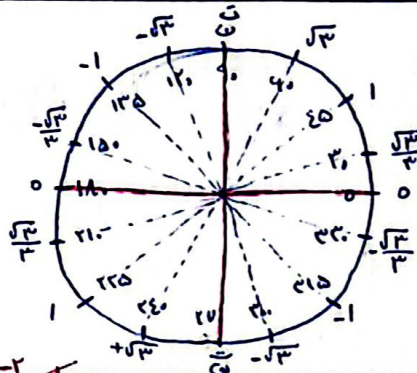


تفاوت زوایای اصلی و



الف) $\sin \frac{\pi}{4} + \cos \pi + \tan \frac{\pi}{2} \rightarrow \boxed{-\frac{1}{2}}$

ب) $-\cos \frac{\pi}{4} + \sin \frac{\pi}{3} - \tan \frac{\pi}{2} \rightarrow \frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} = \boxed{\frac{2\sqrt{2} + \sqrt{3}}{2}}$

ج) $\cot \frac{\pi}{4} + \tan \frac{\pi}{3} - \tan \frac{\pi}{2} \rightarrow \frac{\sqrt{2}}{2} + \sqrt{3} + \frac{\sqrt{2}}{2} = \boxed{\frac{2\sqrt{2} + \sqrt{3}}{2}}$

د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{2}) \rightarrow 1 + 1 = \boxed{2}$

$2\pi = 0, \frac{\pi}{2} = 90, \pi = 180, \frac{3\pi}{2} = 270$

$\frac{\pi}{4} = 45, \frac{2\pi}{3} = 120, \frac{5\pi}{4} = 225, \frac{5\pi}{3} = 300$

$\frac{\pi}{6} = 30, \frac{2\pi}{3} = 120, \frac{5\pi}{4} = 225, \frac{5\pi}{3} = 300$

$\frac{\pi}{4} = 45, \frac{5\pi}{4} = 225, \frac{5\pi}{3} = 300, \frac{11\pi}{4} = 330$

$f(w) = \begin{cases} w^2 + \varepsilon w, & w \geq a \\ 2w + a + \varepsilon, & w \leq a \end{cases}$

$w = a \rightarrow a^2 + \varepsilon a = \frac{2a + a}{2} + \varepsilon$

$a^2 + a - 2 = 0 \rightarrow a < -2 \checkmark \Rightarrow a > 0$

$f(1) \rightarrow 1 + \varepsilon = \boxed{5}$

$f(w) = \begin{cases} 2w^2 - b, & |w+1| \geq 2 \rightarrow w \geq 1 \text{ و } w \leq -3 \\ a + 2w, & -3 \leq w \leq -1 \end{cases}$

$w = -3 \rightarrow 2(-3)^2 - b = a - 4 \rightarrow \boxed{a + b = 24}$

الف) $y = \frac{1}{w^3 - \varepsilon w^2} \rightarrow w^2(w - \varepsilon) \neq 0$

$\begin{matrix} 0 \\ \downarrow \\ \varepsilon \end{matrix}$

$D = \mathbb{R} - \{0, \varepsilon\}$

ب) $y = \frac{1}{2w^3 + \varepsilon w^2 + 2w + \varepsilon}$

$2w^2(w+2) + 2(w+2) \rightarrow (2w^2+2)(w+2) \neq 0$

$D = \mathbb{R} - \{-2\}$

هیچ وقت صفر نمی شود

الف) $y = \sqrt{x^2-1} + \sqrt{x-2} \rightarrow x-2 \geq 0 \rightarrow x \geq 2$

$x^2-1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1 \text{ و } x \leq -1 \rightarrow ([1, +\infty) \cup (-\infty, -1]) \cap [2, +\infty) = [2, +\infty)$

ب) $y = \frac{\sqrt{4-3x}}{\sqrt{4x-3}}$

$4-3x \geq 0 \rightarrow 3x \leq 4 \rightarrow x \leq \frac{4}{3}$
 $4x-3 > 0 \rightarrow 4x > 3 \rightarrow x > \frac{3}{4} \rightarrow D = (\frac{3}{4}, \frac{4}{3}]$

$y = \sqrt{4x-a} + \sqrt{b-3x} \quad D = \{x\}$

$x=2 \rightarrow \sqrt{12-a} + \sqrt{b-6}$

$12-a \geq 0 \rightarrow a \leq 12 \rightarrow a=12$

$b-6 \geq 0 \rightarrow b \geq 6 \rightarrow b=6$

$\frac{b}{a} = \frac{6}{12} = \frac{1}{2}$

الف) $y = \sqrt{\frac{x^2-x-4}{x^2-13x^2+44}} \geq 0 \rightarrow x^2-x-4 \rightarrow (x-3)(x+2)$
 $x^2-13x^2+44 \rightarrow (x^2-4)(x^2-9) \rightarrow (x-2)(x+2)(x-3)(x+3)$

$D: (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$

ب) $y = \sqrt{\frac{x^2-2x^2-5x+4}{x^2+2x^2-5x-4}} \geq 0$

$\frac{x^2-2x^2-5x+4}{x^2+2x^2-5x-4} \geq 0 \rightarrow \frac{-x^2-5x+4}{3x^2-5x-4} \geq 0$
 $\frac{-x^2-5x+4}{-x^2-5x+4} \geq 0 \rightarrow \frac{(x-1)(x+4)}{(x-1)(x+4)} \geq 0$

$\frac{x^2+2x^2-5x-4}{x^2+2x^2-5x-4} \geq 0 \rightarrow \frac{3x^2-5x-4}{3x^2-5x-4} \geq 0$
 $\frac{3x^2-5x-4}{3x^2-5x-4} \geq 0 \rightarrow \frac{(x-2)(x+1)(x+2)}{(x-2)(x+1)(x+2)} \geq 0$

$D: (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$

الف) $y = \sqrt{2[x]-3} \rightarrow 2[x]-3 \geq 0 \rightarrow [x] \geq \frac{3}{2} \rightarrow D = [2, +\infty)$

ب) $y = \sqrt{2[x]-5} \rightarrow [x] \geq \frac{5}{2} \rightarrow [x] \geq 3 \rightarrow D = [3, +\infty)$

الف) $y = \sqrt{\frac{x+1}{12x^2-1}} + \sqrt{\frac{4-x}{x^2+2x+2}}$

$\frac{x+1}{12x^2-1} \geq 0 \rightarrow x < -\frac{1}{\sqrt{12}}$

$\frac{4-x}{x^2+2x+2} \geq 0 \rightarrow x=4$

$D = [-1, 4) \cup (4, 4]$

ب) $y = \sqrt{[x]-3} + \sqrt{2-[x]}$

$[x]-3 \geq 0 \rightarrow [x] \geq 3 \rightarrow x \geq 3$

$2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow x < 3$

$D = \emptyset$