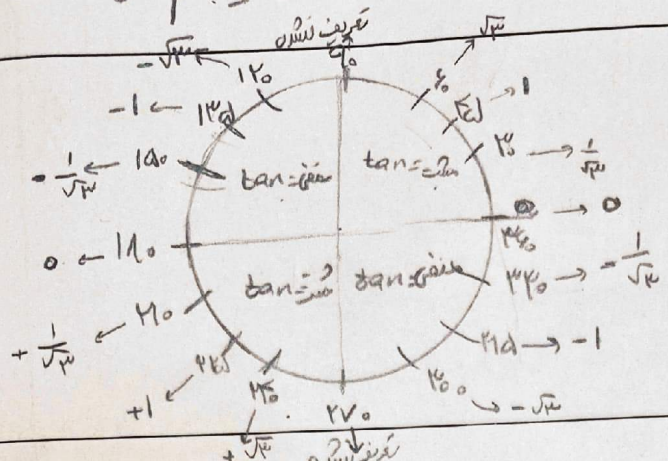




$$\tan \alpha = \frac{\sin}{\cos}$$

$$\frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{1} = \sqrt{3}$$

$$\frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{-1}{\sqrt{3}} = -\frac{1}{\sqrt{3}}$$

$$\frac{\frac{\sqrt{3}}{2}}{\frac{\sqrt{3}}{2}} = 1$$

الف $\sin \frac{\pi}{6} + \cos \pi + \tan \frac{\pi}{6} \Rightarrow \frac{1}{2} + (-1) - \frac{1}{\sqrt{3}} = \frac{1}{2} - \frac{\sqrt{3}}{2} = -\frac{1}{2}$

ب) $-\cos \frac{\pi}{6} + \sin \frac{\pi}{6} - \tan \frac{\pi}{6} \Rightarrow -\left(\frac{\sqrt{3}}{2}\right) + \frac{1}{2} - \frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{2} + \frac{1}{2} - \frac{\sqrt{3}}{3} = -\frac{\sqrt{3}}{2} + \frac{1}{2} - \frac{\sqrt{3}}{3}$

ج) $\cos \frac{\pi}{6} + \tan \frac{\pi}{6} - \sin \frac{\pi}{6} \Rightarrow \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{3}} - \frac{1}{2} = \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{3} - \frac{1}{2} = \frac{5\sqrt{3}}{6} - \frac{1}{2}$

د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{6}) \Rightarrow 1 + 1 = 2$

$f(x) = \begin{cases} x^2 + x & x > a \\ 2x + a + 1 & x \leq a \end{cases}$
 $f(1) = ?$
 $a > 0$
 $a^2 + 1 = 2a + a + 1 \Rightarrow a^2 + 1 = 3a + 1 \Rightarrow a^2 - 3a = 0 \Rightarrow a(a-3) = 0 \Rightarrow a = 3$
 $f(1) = 1 + 1 = 2$

$f(x) = \begin{cases} 2x^2 - b & |x+1| \geq 2 \\ a + 2x & -3 \leq x \leq -1 \end{cases}$
 $|x+1| \geq 2 \Rightarrow x+1 \geq 2 \Rightarrow x \geq 1$
 $x+1 \leq -2 \Rightarrow x \leq -3$
 $2x^2 - b = 18 - b$
 $a + 2(-3) = a - 6$
 $18 - b = a - 6 \Rightarrow 24 = a + b$

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

ب) $y = \frac{1}{2x^2 + 3x + 1}$
 $2x^2 + 3x + 1 \neq 0 \Rightarrow (2x+1)(x+1) \neq 0 \Rightarrow x \neq -\frac{1}{2}, -1 \Rightarrow D_f = \mathbb{R} - \{-\frac{1}{2}, -1\}$

الف) $y = \sqrt{\frac{x^2 - x - 6}{x^2 - 14x^2 + 44}} \geq 0$

$x^2 = t$

$\frac{(x-3)(x+2)}{(x-2)(x-4)}$

$D_f = (-\infty, -2) \cup (2, 3) \cup (3, +\infty)$

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

$\frac{(x-1)(x-2)}{(x-1)(x+2)}$

$D_f = (-\infty, -2) \cup [-1, -1] \cup [1, 2) \cup (2, +\infty)$

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

$\frac{b}{a} \Rightarrow \frac{4}{14} = \frac{1}{\frac{7}{2}}$

$D_f = \{ \frac{7}{2} \}$

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

$x^2 - 1 \geq 0 \Rightarrow x \leq -1 \text{ or } x \geq 1$

$x - 1 \geq 0 \Rightarrow x \geq 1$

$D_f = [1, +\infty)$

ب) $y = \frac{\sqrt{4 - 2x}}{\sqrt{4x - 2}} \geq 0 \Rightarrow x \leq 2$

$4x - 2 \geq 0 \Rightarrow x \geq \frac{1}{2}$

$D_f = (\frac{1}{2}, 2]$

الف) $\sqrt{2[x] - 4} \geq 0 \Rightarrow 2[x] - 4 \geq 0 \Rightarrow [x] \geq 2 \Rightarrow x \geq 2 \Rightarrow D_f = [2, +\infty)$

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

الف) $y = \sqrt{\frac{x+1}{|x-1|}} + \sqrt{\frac{4-x}{x^2+1x+5}} \geq 0$

$\frac{x+1}{|x-1|} \geq 0 \Rightarrow x \leq -1 \text{ or } x \geq 1$

$\frac{4-x}{x^2+1x+5} \geq 0 \Rightarrow x \leq 4$

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

ب) $y = \sqrt{[x] - 4} + \sqrt{4 - [x]}$

$[x] - 4 \geq 0 \Rightarrow [x] \geq 4 \Rightarrow x \geq 4$

$4 - [x] \geq 0 \Rightarrow 4 \geq [x] \Rightarrow x < 5$

$D_f = \emptyset$