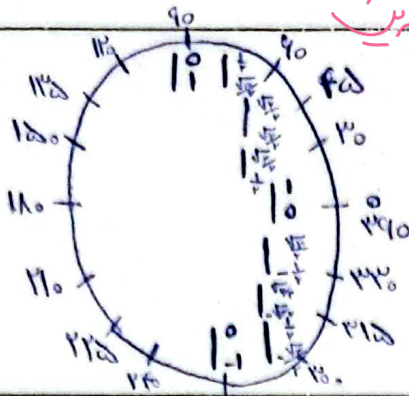




$\tan 0^\circ = 0, \tan 18^\circ = 1$
 $\tan 3^\circ = \frac{\sqrt{3}}{3}, \tan 45^\circ = 1, \tan 16^\circ = \frac{\sqrt{3}}{3}$
 $\tan 45^\circ = 1, \tan 135^\circ = -1, \tan 225^\circ = 1 \rightarrow \tan 135^\circ = -1$
 $\tan 6^\circ = \sqrt{3}, \tan 11^\circ = -\sqrt{3} \rightarrow \tan 2^\circ = \sqrt{3} \rightarrow \tan 1^\circ = \sqrt{3}$
 $\tan 9^\circ = \text{تقریبی} \rightarrow \tan 27^\circ = \text{تقریبی}$
 $\tan = \frac{\sin}{\cos}$

الف) $\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{\pi}{4} \rightarrow \frac{1}{2} + (-1) + 2(-1) \rightarrow -2 + \frac{1}{2} = -\frac{3}{2}$
 ب) $-\cos \frac{5\pi}{4} + \sin \frac{\pi}{3} - 3 \sin \frac{\pi}{6} \rightarrow \frac{\sqrt{2}}{2} + (\frac{\sqrt{3}}{2}) - 3(\frac{1}{2}) = \frac{\sqrt{2} + \sqrt{3} - 3}{2}$
 ج) $\cos \frac{\pi}{4} + 3 \cos \frac{\pi}{3} - 2 \tan \frac{5\pi}{4} = -\frac{\sqrt{2}}{2} + 3(\frac{1}{2}) - 2(-\frac{\sqrt{2}}{2}) = \frac{3\sqrt{2} + 3}{2}$
 د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{4}) = 1 + 1 = 2$

$f(x) = \begin{cases} x^2 + 4x & x \geq a \\ 2x + a + 2 & x < a \end{cases}$
 $a^2 + 4a = 2a + a + 2 \rightarrow a^2 + 2a - 2 = 0 \rightarrow a = 1, a = -2$
 $\begin{cases} x^2 + 4x & x \geq 1 \\ 2x + 3 & x < 1 \end{cases} \rightarrow 1 + f(1) = 5$

$f(x) = \begin{cases} 2x^2 - b & |x+1| \geq 2 \\ a + 2x & -3 \leq x \leq -1 \end{cases}$
 if $x = -3 \rightarrow \begin{cases} 2(9) - b = a - 4 \\ 11 - b = a - 4 \\ a + b = 14 \end{cases}$

الف) $y = \frac{1}{x^2 - 4x^2} \rightarrow x^2 - 4x^2 \neq 0 \rightarrow x^2(x - 4) \neq 0$
 $\mathbb{R} - \{0, 4\}$
 ب) $y = \frac{1}{2x^2 + 4x^2 + 2x + 6}$
 $2x^2(x+2) + 2(x+2) \rightarrow 2(x+2)(x^2+1)$
 $x+2 \neq 0 \rightarrow x \neq -2$
 $x^2+1 \neq 0 \rightarrow x^2 \neq -1$
 $\mathbb{R} - \{-2\}$

الف) $y = \sqrt{x^2-1} + \sqrt{x-2}$ $x^2-1 \geq 0$ $x^2 \geq 1$ $x \geq 1$ و $x \leq -1$ $x-2 \geq 0$ $x \geq 2$ ب) $y = \frac{\sqrt{4-3x}}{\sqrt{4x-3}}$ $4-3x \geq 0$ $4 \geq 3x$ $2 \geq x$ $4x-3 \geq 0$ $4x \geq 3$ $x \geq \frac{3}{4}$ } $D_f = [\frac{3}{4}, 2]$ مفروضه بنایه ضروری! راه حل نامر را دوستم! این سین منهدل	۶
$4x-a \geq 0 \rightarrow x \geq \frac{a}{4}$ $\frac{a}{4} = 2 \rightarrow a = 12$ $\frac{b}{a} = \frac{1}{2}$ $b-3x \geq 0 \rightarrow x \leq \frac{b}{3}$ $\frac{b}{3} = 2 \rightarrow b = 6$	۷
الف) $y = \sqrt{\frac{x^2-x-9}{x^2-13x^2+36}}$ $\frac{x^2-x-9}{x^2-13x^2+36} \geq 0$ $\frac{(x+2)(x-3)}{(x-4)(x-9)} \geq 0$ $\frac{-3}{+} \frac{-2}{-} \frac{2}{-} \frac{3}{+}$ $x^2=t \rightarrow t^2-13t+36$ $t=2 \rightarrow x^2=2 \rightarrow x=\pm\sqrt{2}$ $t=9 \rightarrow x^2=9 \rightarrow x=\pm 3$ $D_f = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$ ب) $y = \sqrt{\frac{x^2-2x^2-2x+9}{x^2+2x^2-2x-9}}$ $\frac{(x-1)(x+2)(x+3)}{(x+1)(x+2)(x+3)} \geq 0$ $\frac{-3}{+} \frac{-2}{-} \frac{-1}{-} \frac{1}{+} \frac{2}{-} \frac{3}{+}$ $D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$	۸
الف) $y = \sqrt{2[x]-4}$ $2[x]-4 \geq 0$ $[x] \geq 2 \rightarrow D_f = [2, +\infty)$ ب) $y = \sqrt{2[x]-5}$ $2[x]-5 \geq 0$ $2[x] \geq 5$ $[x] \geq \frac{5}{2}$ $(2, 5)$ $[x] \geq 2, 5 \rightarrow D_f = [3, +\infty)$	۹
الف) $y = \sqrt{\frac{x+1}{ x-1 }} + \sqrt{\frac{4-x}{x^2+2x+1}}$ $\frac{x+1}{ x-1 } \geq 0$ $\frac{-1}{+} \frac{1}{+}$ $x \geq -1$ $x \neq 1$ $\frac{4-x}{(x+1)^2+1}$ $\frac{-1}{+} \frac{4}{+}$ $x \leq 4$ $x \neq -1$ $D_f = (-1, 3) \cup (3, 4]$ ب) $y = \sqrt{[x]-4} + \sqrt{2-[x]}$ $[x]-4 \geq 0$ $[x] \geq 4 \rightarrow D_f = [4, +\infty)$ $2-[x] \geq 0$ $2 \geq [x] \rightarrow D_f = (-\infty, 2)$ $D_f = \emptyset$	۱۰

عبارت زیر را سوال باید نامتنی و عبارت صفر مخالف صفر باشد...
(4-ب) $y = \frac{\sqrt{4-3n}}{\sqrt{4n-3}}$

$$4-3n \geq 0 \rightarrow n \leq 2$$

$$4n-3 > 0 \rightarrow n > \frac{1}{4}$$

$$\rightarrow \frac{1}{4} < n \leq 2 \rightarrow D_f = \left(\frac{1}{4}, 2\right]$$