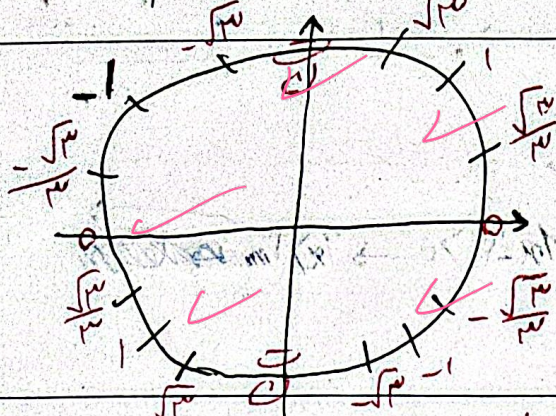


۲۰ آریسین عالی نوشتن ضعیف خوب



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

ب) $-\cos \frac{5\pi}{4} + \sin \frac{3\pi}{4} - 2 \sin \frac{\pi}{4} = -(-\frac{\sqrt{2}}{2}) + \frac{\sqrt{2}}{2} - 2(\frac{\sqrt{2}}{2}) = \frac{\sqrt{2}}{2}$

ج) $\cot \frac{3\pi}{4} + 2 \cot \frac{\pi}{4} - 2 \tan \frac{5\pi}{4} = -\frac{\sqrt{2}}{\sqrt{2}} + 2(\frac{\sqrt{2}}{\sqrt{2}}) - 2(-\frac{\sqrt{2}}{\sqrt{2}}) = \frac{3\sqrt{2}}{\sqrt{2}}$

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

$$f(a) = \begin{cases} a^2 + 2a & (n > a) \\ 2a + a + 2 & (n \leq a) \end{cases} \rightarrow a^2 + 2a = 2a + 2 \rightarrow a^2 + a - 2 = 0$$

$$(a+2)(a-1) = 0$$

$$\begin{cases} a = -2 \\ a = 1 \end{cases} \rightarrow a \neq 1/2$$

$$a = 1 \rightarrow f(1) = 1 + 2 = 3$$

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

$$\begin{cases} n+1 \geq 2 \rightarrow n \geq 1 \\ n+1 \leq -2 \rightarrow n \leq -3 \end{cases} \rightarrow (-\infty, -3] \cup [1, +\infty)$$

که بازار سه با صد و سه با یک جواب باید دهند

$$2(-3)^2 - b = a - 4 \rightarrow a + b = 22$$

الف) $y = \frac{1}{x^3 - 4x^2} = \frac{1}{x^2(x-4)}$

$x^2(x-4) \neq 0 \rightarrow \begin{cases} x^2 = 0 \rightarrow x = 0 \\ x - 4 = 0 \rightarrow x = 4 \end{cases} \rightarrow D_f = \mathbb{R} - \{0, 4\}$

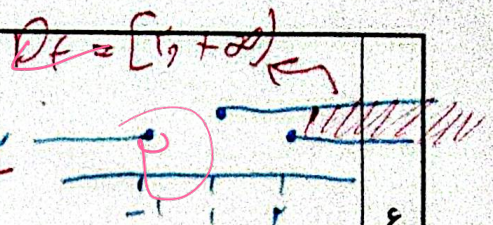
ب) $y = \frac{1}{2n^3 + 2n^2 + 2n + 4} = \frac{1}{2n(n^2 + 1) + 2(n+1)} = \frac{1}{(2n+2)(n^2+1)}$

$(n^2+1)(2n+2) \neq 0 \rightarrow \begin{cases} n^2+1 = 0 \\ 2n+2 = 0 \end{cases}$

$$\begin{cases} n^2+1 = 0 \rightarrow \text{no real solution} \\ 2n+2 = 0 \rightarrow n = -1 \end{cases} \rightarrow D_f = \mathbb{R} - \{-1\}$$

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

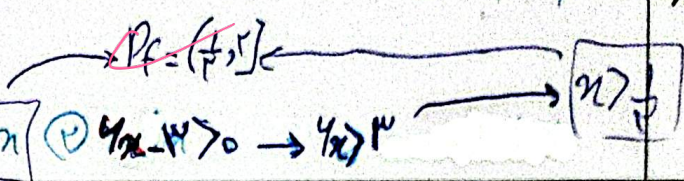
① $x^2 - 1 \geq 0 \rightarrow \underline{x \geq 1}$ ② $x - 1 \geq 0 \rightarrow \underline{x \geq 1}$



$$y = \frac{\sqrt{4 - 13x}}{\sqrt{4x - 13}} =$$

① $4 - 13x \geq 0 \rightarrow 4 \geq 13x \rightarrow \underline{13x \leq 4}$ ② $4x - 13 \geq 0 \rightarrow 4x \geq 13$

$D_f = \left(\frac{13}{4}, 4\right]$



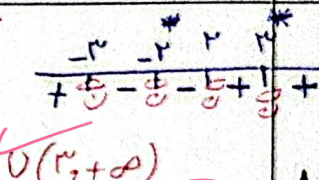
$$y = \sqrt{4n - a} + \sqrt{b - 5n} \rightarrow b - 5n \geq 0 \rightarrow b \geq 5n \xrightarrow{n=1} \boxed{b=9}$$

$D_f = \{1\} \rightarrow 4n - a \geq 0 \rightarrow a \leq 4n \rightarrow \frac{a}{4} \leq n \xrightarrow{n=1} \frac{a}{4} = 1 \rightarrow \boxed{a=4}$

$\frac{b}{a} = ? \rightarrow \frac{9}{4} = \boxed{\frac{9}{4}}$

الف) $y = \sqrt{\frac{x^2 - x - 4}{x^2 - 13x^2 + 13y}} = \sqrt{\frac{(x-1)(x+4)}{(x-1)(x+1)(x+2)(x-4)}}$

$\rightarrow (x^2 - 1)(x^2 - 9)$ $D_f = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$



ب) $y = \sqrt{\frac{x^2 - 13x^2 - 5x + 4}{x^2 + 13x^2 - 5x - 4}} = \sqrt{\frac{(x-1)(x-4)(x+2)}{(x+1)(x+2)(x-1)(x-4)}}$

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

ج) $y = \sqrt{2[n] - 1} \rightarrow 2[n] - 1 \geq 0 \rightarrow [n] - \frac{1}{2} \geq 0 \rightarrow [n] \geq \frac{1}{2} \rightarrow n \geq 1$

$D_f = [1, +\infty)$

د) $y = \sqrt{2[n] - 5} \rightarrow 2[n] - 5 \geq 0 \rightarrow [n] \geq \frac{5}{2} \rightarrow [n] \geq 3$

$D_f = [3, +\infty)$

هـ) $y = \sqrt{\frac{n+1}{|n-1|}} + \sqrt{\frac{4-n}{x^2 + 13x^2 + 13}}$

$|n-1| \neq 0 \rightarrow n \neq 1$ $4-n \geq 0 \rightarrow 4 \geq n$ $x^2 + 13x^2 + 13 \geq 0 \rightarrow +\infty$

$\Rightarrow -1 < n \leq 4 - \{1\}$ $D_f = [-1, 4] - \{1\}$

و) $y = \sqrt{[n] - 1} + \sqrt{1 - [n]}$

$[n] - 1 \geq 0 \rightarrow [n] \geq 1 \rightarrow n \geq 1$

$1 - [n] \geq 0 \rightarrow [n] \leq 1 \rightarrow n \leq 2 \rightarrow n \in (-\infty, 2]$

$D_f = [1, 2]$

