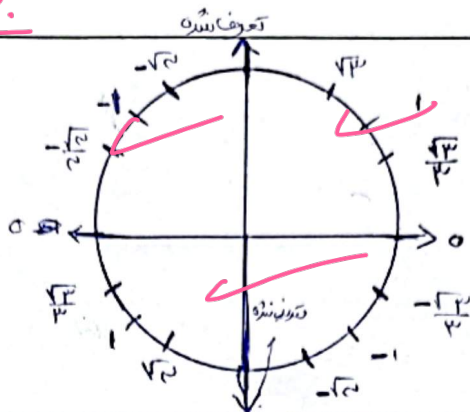


۲. آفرین عالی نوشتی



۱

الف) $\frac{1}{4} + (-1) + (-2) = -\frac{5}{4} \neq -\frac{3}{4}$

ب) $\frac{\sqrt{3}}{4} + \frac{\sqrt{3}}{4} - 2(-\frac{\sqrt{3}}{4}) = \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} = \sqrt{3}$

ج) $-\frac{\sqrt{3}}{4} + 3 \times (\frac{\sqrt{3}}{4}) - 2(-\frac{\sqrt{3}}{4}) = (\frac{\sqrt{3}}{4})(-1+3+2) = \frac{4}{4}\sqrt{3} = \sqrt{3}$

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

۲

$P(x) = ax^2 + bx + c$ به ازای a هر دو ضریب باید متساوی باشند $\Rightarrow a^2 + 6a = 3a + 2$

$\Rightarrow a^2 + 3a - 2 = 0$ $\xrightarrow{\text{تجزیه ضرایب}} x = 1, -2 \Rightarrow a = 1, -2$ $\xrightarrow{\text{طبق } a=1}$ $a=1$

$P(x) = \begin{cases} x^2 + 6x & x \geq 1 \\ 2x + c & x < 1 \end{cases} \Rightarrow P(1) = a^2 + 6a = 3a + 2$ $\Rightarrow a^2 + 3a - 2 = 0$ $\Rightarrow a = 1, -2$ $\Rightarrow a=1$ $\Rightarrow c = -5$

۳

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

$\Rightarrow$ برای $x = -1$ $\Rightarrow x = -1 \Rightarrow 1 - b = a + (-2) \Rightarrow a + b = 3$

۴

الف) $y = \frac{1}{x^2 - 5x^2} \Rightarrow x^3 - 5x^2 \neq 0 \Rightarrow x^2(x-5) \neq 0 \Rightarrow \begin{cases} x \neq 0 \\ x \neq 5 \end{cases}$

$\Rightarrow D_f = \mathbb{R} - \{0, 5\}$

ب) $y = \frac{1}{x^2 + 2x^2 + 2x + 2} \Rightarrow 2x^2 + 2x^2 + 2x + 2 \neq 0 \Rightarrow 4x^2 + 2x + 2 \neq 0$

$\Rightarrow x^2(x+2) + (x+2) \neq 0 \Rightarrow (x+2)(x^2+1) \neq 0 \Rightarrow x \neq -2 \Rightarrow D_f = \mathbb{R} - \{-2\}$

۵

الف) $y = \sqrt{x^2-1} + \sqrt{x-2} \Rightarrow \begin{cases} x^2-1 \geq 0 \Rightarrow x^2 \geq 1 \Rightarrow x \geq 1 \wedge x \leq -1 \\ x-2 \geq 0 \Rightarrow x \geq 2 \end{cases} \Rightarrow x \geq 2$ $\Rightarrow D_f = [2, +\infty)$ ب) $y = \frac{\sqrt{4-n}}{\sqrt{4n-2}} \Rightarrow \begin{cases} 4-n \geq 0 \Rightarrow n \leq 4 \\ 4n-2 > 0 \Rightarrow 4n > 2 \Rightarrow n > \frac{1}{2} \end{cases} \Rightarrow \frac{1}{2} < n \leq 4$ $\Rightarrow D_f = (\frac{1}{2}, 4]$	6
$y = \sqrt{4n-a} + \sqrt{b-n} \Rightarrow \begin{cases} b-n \geq 0 \Rightarrow n \leq \frac{b}{1} \\ 4n-a \geq 0 \Rightarrow n \geq \frac{a}{4} \end{cases} \Rightarrow D_f = [\frac{a}{4}, \frac{b}{1}]$ $\Rightarrow a=12, b=4 \Rightarrow \frac{b}{a} = \frac{1}{3}$ $\frac{b}{a} = \frac{a}{4} = 2$	7
الف) $y = \sqrt{\frac{x^2-x-4}{x^2-13x^2+24}} = f(x) \Rightarrow \frac{x^2-x-4}{x^2-13x^2+24} = \frac{(x-2)(x+2)}{(x-2)(x+2)(x-2)(x+2)} \geq 0$ $\Rightarrow D_f = (-\infty, -2) \cup (2, +\infty)$ ب) $y = \sqrt{\frac{x^2-2x^2-8x+4}{x^2+2x^2-8x-4}} \Rightarrow \frac{(x-1)(x-2)(x+2)}{(x+1)(x-2)(x+2)} \geq 0$ $\Rightarrow D_f = (-\infty, -2) \cup [-2, -1) \cup (1, +\infty)$	8
الف) $y = \sqrt{2[n]-5} = f(n) \Rightarrow 2[n]-5 \geq 0 \Rightarrow 2[n] \geq 5 \Rightarrow [n] \geq \frac{5}{2} \Rightarrow n \geq 2 \Rightarrow D_f = [2, +\infty)$ ب) $y = \sqrt{2[n]-5} = g(n) \Rightarrow 2[n]-5 \geq 0 \Rightarrow 2[n] \geq 5 \Rightarrow [n] \geq \frac{5}{2} \Rightarrow n \geq 2 \Rightarrow D_g = [2, +\infty)$	9
الف) $y = \sqrt{\frac{x+1}{ x-1 }} + \sqrt{\frac{4-x}{x^2+2x+5}} \Rightarrow \frac{x+1}{ x-1 } \geq 0 \Rightarrow \frac{4-x}{x^2+2x+5} \geq 0$ $\Rightarrow D_f = [-1, 3) \cup (3, 4] = [-1, 4] - \{3\}$ ب) $y = \sqrt{[x]-5} + \sqrt{2-[x]} \Rightarrow \begin{cases} [x]-5 \geq 0 \Rightarrow [x] \geq 5 \Rightarrow x \geq 5 \\ 2-[x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x \in (-\infty, 2] \end{cases} \Rightarrow D_f = \emptyset$	10

$\downarrow$
 $[2, +\infty)$