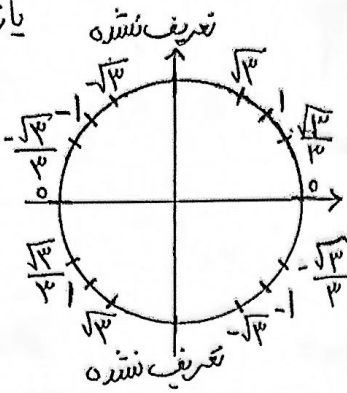


یازدهم دختر B



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

$f(x) = \begin{cases} x^2 + 2x & x \geq a \\ 2x + a + 2 & x < a \end{cases} \Rightarrow a^2 + 2a = 2a + a + 2 \Rightarrow a^2 + a - 2 = 0 \Rightarrow a = 1 \vee a = -2$
 چون گفته $a > 0$ پس $a = 1$
 $f(1) = 1^2 + 2(1) = 3$

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

الف) $y = \frac{1}{x^3 - 4x^2} = \frac{1}{x^2(x-4)} \Rightarrow \frac{1}{x^2} = \frac{1}{x^2} + \frac{1}{x-4} \Rightarrow D_f = \mathbb{R} - \{0, 4\}$
 ب) $y = \frac{1}{2x^3 + 5x^2 + 2x + 4} \Rightarrow 2x^3 + 5x^2 + 2x + 4 \neq 0 \Rightarrow (x+2)(2x^2 + x + 2) \neq 0 \Rightarrow x \neq -2$
 $D_f = \mathbb{R} - \{-2\}$

الف) $y = \sqrt{x^2 - 1} + \sqrt{x - 2} \Rightarrow \begin{cases} x^2 - 1 \geq 0 \Rightarrow x \geq 1 \vee x \leq -1 \\ x - 2 \geq 0 \Rightarrow x \geq 2 \end{cases} \Rightarrow D_f = [2, +\infty)$
 ب) $y = \frac{\sqrt{2x}}{\sqrt{6x-3}} \Rightarrow \begin{cases} 2x \geq 0 \Rightarrow x \geq 0 \\ 6x - 3 > 0 \Rightarrow x > \frac{1}{2} \end{cases} \Rightarrow D_f = (\frac{1}{2}, +\infty)$

$y = \sqrt{x-a} + \sqrt{b-3x} \Rightarrow \begin{cases} x-a \geq 0 \Rightarrow x \geq \frac{a}{6} \\ b-3x \geq 0 \Rightarrow x \leq \frac{b}{3} \end{cases} \Rightarrow \frac{a}{6} \leq x \leq \frac{b}{3} \Rightarrow \frac{b}{a} = \frac{3}{6} = \frac{1}{2}$

الف) $y = \sqrt{\frac{x^2 - x - 2}{x^4 - 13x^2 + 36}} \Rightarrow \frac{(x-2)(x+2)}{(x-2)(x+2)(x-3)(x+4)} \geq 0 \Rightarrow \frac{1}{(x-3)(x+4)} \geq 0 \Rightarrow D_f = (-\infty, -3) \cup (3, +\infty) - \{2\}$

ب) $y = \sqrt{\frac{x^2 - 2x^2 - 2x + 6}{x^3 + 2x^2 - 2x - 6}} \Rightarrow \frac{-x^2 - 2x + 6}{x^3 + 2x^2 - 2x - 6} \geq 0 \Rightarrow \frac{-(x^2 + 2x - 6)}{(x-1)(x+3)(x+2)} \geq 0 \Rightarrow \frac{-(x-2)(x+3)}{(x-1)(x+3)(x+2)} \geq 0 \Rightarrow \frac{-(x-2)}{(x-1)(x+2)} \geq 0$
 $D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup (2, +\infty)$

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

ب) $y = \sqrt{2[x] - 5} \Rightarrow 2[x] - 5 \geq 0 \Rightarrow [x] \geq \frac{5}{2} \Rightarrow D_f = [\frac{5}{2}, +\infty)$

الف) $y = \sqrt{\frac{-1}{x+1}} + \sqrt{\frac{4-x}{x^2+2x+4}} \Rightarrow \left. \begin{array}{l} ① \frac{x+1}{|x-3|} \geq 0 \Rightarrow \frac{-1}{x+1} \geq 0 \Rightarrow [-1, +\infty) - \{3\} \\ ② \frac{4-x}{x^2+2x+4} \geq 0 \Rightarrow \frac{4}{x+1} \geq 0 \Rightarrow x < 4 \end{array} \right\} \Rightarrow D_f = [-1, 4] - \{3\}$

$\Delta = 4 - 16 = -12 < 0 \Rightarrow$ ریشه در اعداد حقیقی ندارد و همواره +

ب) $y = \sqrt{[x] - 4} + \sqrt{2 - [x]} \Rightarrow \left. \begin{array}{l} ① [x] - 4 \geq 0 \Rightarrow [x] \geq 4 \Rightarrow x \geq 4 \\ ② 2 - [x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x < 3 \end{array} \right\} \Rightarrow D_f = \emptyset$

چون اشتراکی ندارند