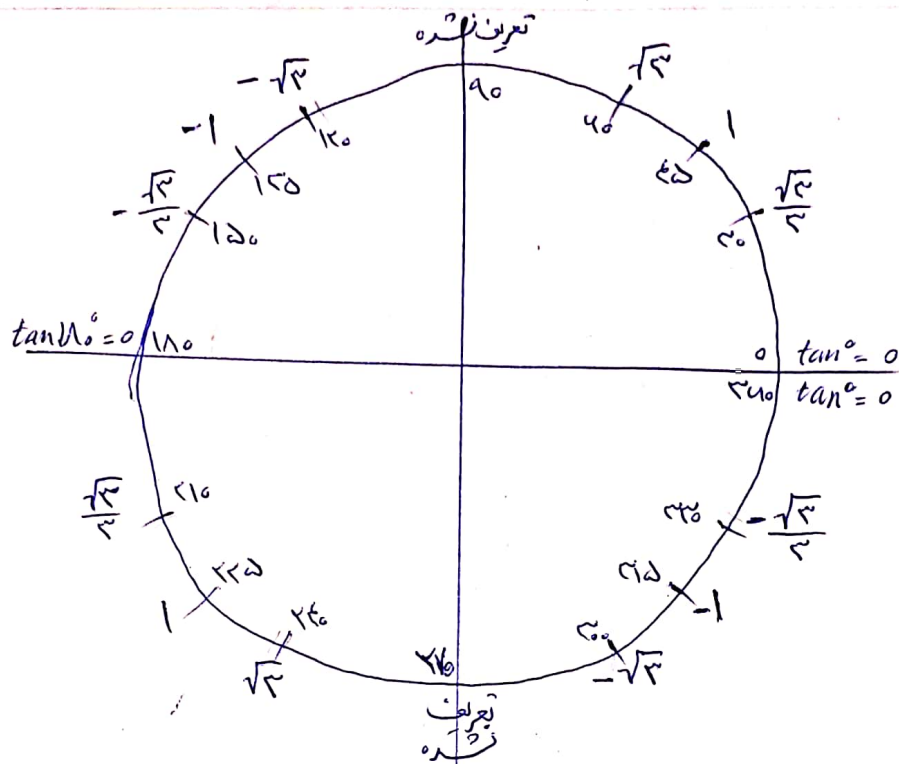


امدی جی

باز هم B در

تکلیف 2



سوال 1:

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

سوال 2:

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

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

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

$$f(x) = \begin{cases} x^2 + 4x & x \geq a \\ 2x + a + 2 & x \leq a \end{cases} \xrightarrow{\frac{a^2 - 2}{a - 1}}$$

$a > 0$

سوال 3:

$$a^2 + 4a = 2a + a + 2 \Rightarrow a^2 + a - 2 = 0 \rightarrow (a+2)(a-1) = 0 \rightarrow \begin{cases} a = -2 \\ a = 1 \end{cases}$$

$$f(1) \xrightarrow{\text{نقطه اتصال}} (1)^2 + 4 \times 1 = \boxed{5}$$

سوال 4:

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

$$2(-3)^2 - b = a + 2(-3) \rightarrow 11 - b = a - 4 \rightarrow 11 + 4 = a + b \rightarrow a + b = \boxed{15}$$

سوال ۵:

$$y = \frac{1}{x^3 - 4x^2} = \frac{1}{x^2(x-4)} \quad x^2(x-4) \neq 0 \begin{cases} x \neq 0 \\ x \neq 4 \end{cases}$$

$$Df = \mathbb{R} - \{0, 4\}$$

$$y = \frac{1}{2x^3 + 5x^2 + 2x + 5} \rightarrow 2x^3 + 5x^2 + 2x + 5 \neq 0$$

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

سوال ۶:

$$\text{الف) } y = \sqrt{x^2 - 1} + \sqrt{x - 2} \rightarrow x \geq 2, \quad \frac{-1}{+} \frac{1}{-} \frac{1}{+}$$

$$\Rightarrow Df = [2, +\infty)$$

$$\text{ب) } y = \frac{\sqrt{4 - 5x}}{\sqrt{4x - 5}} \rightarrow \begin{cases} 4x - 5 > 0 \\ 4 - 5x \geq 0 \end{cases} \Rightarrow Df = \left(\frac{1}{5}, 2\right]$$

سوال ۷:

$$y = \sqrt{4x - a} + \sqrt{b - 5x} \quad Df = \{2\} \quad \begin{matrix} \text{محدود} \\ \text{صفری کند} \end{matrix} \quad \frac{b}{a} = \frac{4}{12} = \frac{1}{3}$$

$$4x - a = 0 \rightarrow a = 12, \quad b - 5x = 0 \rightarrow b = 4$$

سوال ۸:

$$\text{الف) } y = \sqrt{\frac{x^2 - x - 4}{x^2 - 13x^2 + 44}} \Rightarrow \frac{(x-5)(x+2)}{x^2 - 13x + 44} = \frac{(x-5)(x+2)}{(x-4)(x-9)}$$

$$x = \begin{cases} 5 \rightarrow x = \pm 2 \\ 9 \rightarrow x = \pm 4 \end{cases} \quad \begin{matrix} -5 & -2 & 2 & 5 \\ + & - & - & + \end{matrix} \rightarrow Df = (-\infty, -2) \cup (2, 4) \cup (5, +\infty)$$

سوال 1:

$$f = \sqrt{\frac{x^3 - 2x^2 - 2x + 4}{x^3 + 2x^2 - 2x - 4}} = \sqrt{\frac{(x-1)(x-2)(x+2)}{(x+1)(x+2)(x-2)}}$$

$$\begin{array}{ccccccccc} & -2 & -1 & 0 & 1 & 2 & 3 & & \\ + & \phi & - & \phi & + & \phi & - & \phi & + \end{array}$$

$$Df = (-\infty, -2) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$$

سوال 9:

$$الف) = \sqrt{2[x] - 4} \rightarrow 2[x] - 4 \geq 0 \rightarrow x \geq 2$$

$$Df = [2, +\infty)$$

$$ب) \sqrt{2[x] - 2} \rightarrow 2[x] - 2 \geq 0 \rightarrow [x] \geq 1 \rightarrow x \geq 2$$

$$\rightarrow Df = [2, +\infty)$$

سوال 10:

$$الف) f = \sqrt{\frac{x+1}{|x-2|}} + \sqrt{\frac{4-x}{x^2+2x+1}}$$

$$x \leq 4 \quad x \geq -1, x \neq 2$$

$$Df = [-1, 4] - \{2\}$$

$$ب) f = \sqrt{[x] - 4} + \sqrt{2 - [x]}$$

$$x \geq 4, x \leq 2 \rightarrow \text{مستحيل} \rightarrow Df = \phi$$