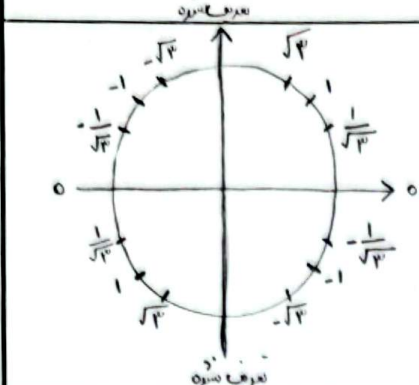


بیشتر امکان دارد نویل برآید جز برد یا صفر نبویس چون جا سوال ضعیف ؟

نام و نام خانوادگی کلاس شماره تکلیف شماره پاسنامه تشریحی ۱۸/۵



$$\tan x = \frac{\sin x}{\cos x}$$

۱

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

ب) $-\cos \frac{5\pi}{4} + \sin \frac{7\pi}{3} - 2 \sin \frac{4\pi}{3} = -(-\frac{\sqrt{2}}{2}) + \frac{\sqrt{3}}{2} - (2 \times -\frac{\sqrt{3}}{2}) = \frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2} + \sqrt{3} = \frac{\sqrt{2} + 3\sqrt{3}}{2} = \boxed{\frac{\sqrt{2} + 3\sqrt{3}}{2}}$

ج) $\cot \frac{7\pi}{3} + 2 \cot \frac{4\pi}{3} - 2 \tan \frac{5\pi}{4} = -\frac{1}{\sqrt{3}} + (2 \times \frac{1}{\sqrt{3}}) + (-2 \times -\frac{1}{\sqrt{2}}) = -\frac{1}{\sqrt{3}} + \frac{2}{\sqrt{3}} + \frac{2}{\sqrt{2}} = \frac{1}{\sqrt{3}} + \sqrt{2} = \boxed{\frac{1}{\sqrt{3}} + \sqrt{2}}$

د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{3}) = 1 + \sin \frac{\pi}{2} = 1 + 1 = \boxed{2}$

۲

$f(x) = \begin{cases} x^2 + \epsilon & x \geq a \\ 2x + a + 2 & x \leq a \end{cases} \quad a > 0 \quad f(1) = 1 + \epsilon = \boxed{a}$

$a^2 + \epsilon a = 2a + a + 2 \Rightarrow a^2 + \epsilon a = 3a + 2 \Rightarrow a^2 + a - 2 = 0 \Rightarrow (a+2)(a-1) = 0$

$\frac{a = -2}{\text{قبول}} \quad \frac{a = 1}{\text{قبول}}$

۳

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

$|x+1| \geq 2 \Rightarrow x+1 \geq 2 \quad \vee \quad x+1 \leq -2 \Rightarrow x \geq 1 \quad \vee \quad x \leq -3 \quad (-\infty, -3] \cup [1, +\infty)$

$2(-3)^2 - b = a + 2(-3) \Rightarrow 18 - b = a - 4 \Rightarrow 18 + 4 = a + b \Rightarrow \boxed{a + b = 24}$

۴

الف) $y = \frac{1}{x^3 - 2x^2} \quad x^3 - 2x^2 \neq 0 \quad x^2(x-2) \neq 0 \Rightarrow \boxed{D_f = \mathbb{R} - \{0, 2\}}$

ب) $y = \frac{1}{2x^3 + \epsilon x^2 + 2x + \epsilon} \quad 2x^3 + \epsilon x^2 + 2x + \epsilon \neq 0 \Rightarrow 2(x^3 + \frac{\epsilon}{2}x^2 + x + \frac{\epsilon}{2}) \neq 0 \Rightarrow$

۵

$x^3 + \frac{\epsilon}{2}x^2 + x + \frac{\epsilon}{2} = 0 \Rightarrow (x^3 + \frac{\epsilon}{2}x^2) + (x + \frac{\epsilon}{2}) \Rightarrow x^2(x + \frac{\epsilon}{2}) + 1(x + \frac{\epsilon}{2}) = (x + \frac{\epsilon}{2})(x^2 + 1) = 0$

$\boxed{D_f = \mathbb{R} - \{-\frac{\epsilon}{2}\}}$

$\downarrow$
 $-\frac{\epsilon}{2}$

$\downarrow$
 $x^2 \neq -1$
برای هر مقدار است

$$a) y = \sqrt{x^2-1} + \sqrt{x-1} \quad x^2-1 \geq 0 \Rightarrow x^2 \geq 1 \quad \begin{cases} x \geq 1 \\ x \leq -1 \end{cases} \quad I$$

$$x-1 \geq 0 \Rightarrow x \geq 1 \quad II$$

$$I \cap II = x \geq 1, [1, +\infty)$$

$$b) y = \frac{\sqrt{4-x^2}}{\sqrt{4x-1}} = 4-x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow x \leq 2 \quad I$$

$$4x-1 > 0 \Rightarrow 4x > 1 \Rightarrow x > \frac{1}{4} \quad II$$

$$I \cap II = \left(\frac{1}{4}, 2\right]$$

$$y = \sqrt{4x-a} + \sqrt{b-12x} \quad D_f = \{x\}$$

$$\frac{b}{a} = \frac{\frac{12+a}{4}}{12b-12} = \frac{12+(12b-12)}{4(12b-12)} = \frac{b}{12b-12}$$

$$4x-a \geq 0, \quad b-12x \geq 0$$

$$4x-a \geq 0 \Rightarrow x \geq \frac{a}{4}, \quad b-12x \geq 0 \Rightarrow 12x \leq b \Rightarrow x \leq \frac{b}{12}$$

$$\frac{a}{4} \leq x \leq \frac{b}{12} \Rightarrow \frac{b}{12} - \frac{a}{4} = 0 \Rightarrow 12b-a=12 \Rightarrow 12b=12+a \Rightarrow b = \frac{12+a}{12}$$

$$a = 12b-12$$

$$a) \sqrt{\frac{x^2-x-4}{x^2-12x^2+124}} \geq 0 \Rightarrow \frac{x^2-x-4}{x^2-12x^2+124} \geq 0 \Rightarrow \frac{(x-2)(x+2)}{(x^2-12)(x^2-9)} \geq 0$$

$$\frac{-}{+} \frac{-}{-} \frac{+}{-} \frac{+}{+} \frac{+}{+}$$

$$(-\infty, -2) \cup (2, 3) \cup (3, +\infty)$$

$$b) \sqrt{\frac{x^2-2x^2-\Delta x+4}{x^2+2x^2-\Delta x-4}} \geq 0 \Rightarrow \frac{x^2-2x^2-\Delta x+4}{x^2+2x^2-\Delta x-4} \geq 0 \Rightarrow \frac{(x-1)(x-2)(x+2)}{(x+1)(x+2)(x-2)} \geq 0$$

$$\frac{-}{+} \frac{-}{-} \frac{+}{-} \frac{+}{+} \frac{+}{+}$$

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

$$c) y = \sqrt{2[x]-5} \Rightarrow 2[x]-5 \geq 0 \Rightarrow 2[x] \geq 5 \Rightarrow [x] \geq \frac{5}{2} \Rightarrow [x] \geq 3 \Rightarrow [x] \geq 3 \Rightarrow [3, +\infty)$$

$$d) y = \sqrt{2[x]-\Delta} \Rightarrow 2[x]-\Delta \geq 0 \Rightarrow 2[x] \geq \Delta \Rightarrow [x] \geq \frac{\Delta}{2} \Rightarrow [x] \geq \frac{\Delta}{2} \Rightarrow \left[\frac{\Delta}{2}, +\infty\right)$$

$$a) y = \sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{4-x}{x^2+12x+5}} \Rightarrow \frac{x+1}{|x-3|} \geq 0 \Rightarrow x \geq -1, x \neq 3, \frac{4-x}{x^2+12x+5} \geq 0 \Rightarrow x^2+12x+5 \geq 0$$

$$(x+1)^2 > 0 \Rightarrow x \leq 4 \Rightarrow (-\infty, 4] \cap [-1, +\infty) \cap x \neq 3 \Rightarrow D_f = [-1, 3) \cup (3, 4]$$

$$b) \sqrt{[x]-5} + \sqrt{2-[x]} \Rightarrow [x]-5 \geq 0 \Rightarrow [x] \geq 5 \Rightarrow [x] \geq 5 \Rightarrow [5, +\infty) \quad \textcircled{I}$$

$$2-[x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow (-\infty, 2) \quad \textcircled{II}$$

$$I \cap II = \emptyset$$