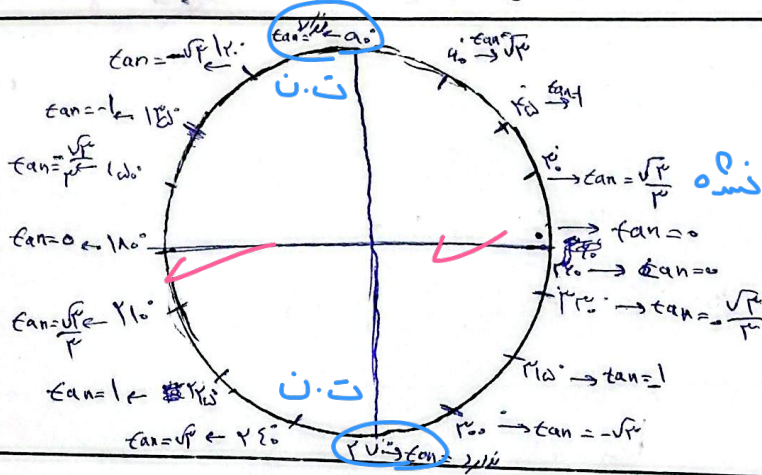




18/05

دیده است به جای نذر بنویس تقریب نذر

2

$$x^2 + 2x = 2x + a + 2 \xrightarrow{x=a} a^2 + 2a = 2a + a + 2 \rightarrow a^2 + a - 2 = 0$$

$$a^2 + a - 2 = 0 \xrightarrow{a+b+c=0} \begin{cases} 1 \\ -2 \end{cases} \xrightarrow{\text{جواب گفت}} a=1$$

$$F(x) = \begin{cases} x+2 & x \geq 1 \\ 2x+1 & x < 1 \end{cases}$$

$$F(1) = 1+2 = 3$$

2

درشش اصفی آخر نذر

* جای سوال 3 و 4 و 5 این است.

الف) $\sin \frac{x}{4} + \cos x + 2 \tan \frac{3x}{4} = \sin 45^\circ + \cos 90^\circ + 2 \tan 135^\circ = \frac{1}{\sqrt{2}} + 0 + 2(-1) = \frac{1}{\sqrt{2}} - 2$

ب) $-\cos \frac{5x}{4} + \sin \frac{2x}{3} - 2 \sin \frac{4x}{3} = -\cos 150^\circ + \sin 120^\circ - 2 \sin 240^\circ = -(-\frac{\sqrt{3}}{2}) + \frac{\sqrt{3}}{2} - 2(\frac{\sqrt{3}}{2}) = \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - \sqrt{3} = 0$

ج) $\cot \frac{2x}{3} + 2 \cot \frac{4x}{3} - 2 \cot \frac{5x}{4} = \cot 120^\circ + 2 \cot 240^\circ - 2 \cot 150^\circ = -\frac{1}{\sqrt{3}} + 2(-\frac{1}{\sqrt{3}}) - 2(-\frac{1}{\sqrt{3}}) = -\frac{1}{\sqrt{3}} - \frac{2}{\sqrt{3}} + \frac{2}{\sqrt{3}} = -\frac{1}{\sqrt{3}}$

د) $\cos(\sin x) + \sin(x \cos \frac{\pi}{3}) = \cos 0 + \sin(\frac{\pi}{2}) = 1 + 1 = 2$

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

$$2x^2 - b = a + 2x \xrightarrow{x=-3} 2(-3)^2 - b = a + 2(-3) \rightarrow 18 - b = a - 6 \rightarrow a = 24 - b$$

2

الف) $y = \frac{1}{x^3 - 2x^2}$

$$x^3 - 2x^2 \neq 0 \rightarrow x^2(x-2) \neq 0 \rightarrow \begin{matrix} x \neq 0 \\ x \neq 2 \end{matrix}$$

$$D_f = \mathbb{R} - \{0, 2\}$$

2

ب) $\frac{1}{2x^3 + 5x^2 + 2x + 2}$

$$2x^3 + 5x^2 + 2x + 2 \neq 0 \rightarrow 2x^2(x+2) + 2(x+1) \neq 0 \rightarrow (x+2)(2x^2+2) \neq 0 \rightarrow (x+2)(x^2+1) \neq 0$$

$$D_f = \mathbb{R} - \{-2\}$$

نقطه برای $x = -2$ منفرجه هم می شود

الف) $y = \sqrt{x^2-1} + \sqrt{x-2}$ $I) x^2-1 \geq 0 \rightarrow (x-1)(x+1) \geq 0$ $II) x-2 \geq 0 \rightarrow x \geq 2$

$I \cap II = x \geq 2 = [2, +\infty)$

نقطة التقاطع: $x=1$ $x=2$

نقطة التقاطع: $x=1$ $x=2$

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

ب) $\frac{\sqrt{4-x}}{\sqrt{4-x}}$ $I) 4-x \geq 0 \rightarrow 4 \geq x \rightarrow x \leq 4$

$II) 4-x \geq 0 \rightarrow 4 \geq x \rightarrow x \leq 4$

$\frac{1}{x} \leq 2 \rightarrow D_f = [\frac{1}{2}, +\infty)$

$y = \sqrt{4x-a} + \sqrt{b-2x}$ $D_y = \{x\}$

$I: 4x-a \geq 0 \rightarrow 4x \geq a \rightarrow x \geq \frac{a}{4}$

$II: b-2x \geq 0 \rightarrow b \geq 2x \rightarrow \frac{b}{2} \geq x$

$\frac{a}{4} = 2 \rightarrow a=8$ $\frac{b}{2} = 2 \rightarrow b=4$

$\frac{b}{a} = \frac{4}{8} = \frac{1}{2}$

الف) $\sqrt{\frac{x^2-x-4}{x^2-12x^2+44}}$ $I: x^2-12x^2+44 \geq 0 \rightarrow -11x^2+44 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2$

$II: \frac{x^2-x-4}{x^2-12x^2+44} \geq 0$ $\Delta = b^2-4ac \rightarrow 1-4(-4)(-11) = -175$ $\Delta < 0$ $\rightarrow$ لا يوجد جذور حقيقية

$x^2-x-4=0 \rightarrow x = \frac{1 \pm \sqrt{17}}{2}$

$(-\infty, -2) \cup (-2, \frac{1-\sqrt{17}}{2}) \cup (\frac{1+\sqrt{17}}{2}, 2) \cup (2, +\infty)$

$D_f = (-\infty, -2) \cup (-2, \frac{1-\sqrt{17}}{2}) \cup (\frac{1+\sqrt{17}}{2}, 2) \cup (2, +\infty)$

الف) $\sqrt{2[x]-5}$ $2[x]-5 \geq 0 \rightarrow 2[x] \geq 5 \rightarrow [x] \geq \frac{5}{2} \rightarrow D_y = [\frac{5}{2}, +\infty)$

ب) $y = \sqrt{2[x]-a}$ $2[x]-a \geq 0 \rightarrow 2[x] \geq a \rightarrow [x] \geq \frac{a}{2} \rightarrow D_y = [\frac{a}{2}, +\infty)$

الف) $\sqrt{\frac{x+1}{|x-1|}} + \sqrt{\frac{4-x}{x^2+2x+5}}$ $D_f = I \cap II = [-1, 2) \cup (2, +\infty) \cap (-\infty, 4] = [-1, 4]$

$I: \frac{x+1}{|x-1|} \geq 0$ $II: \frac{4-x}{x^2+2x+5} \geq 0$

$I: x \geq 1$ $II: x \leq 4$

$D_f = [-1, 4]$

ب) $\sqrt{[x]-4} + \sqrt{2-[x]}$ $D_f = I \cap II: [x] \geq 4 \cap [x] \leq 2 = \emptyset$

$I: [x]-4 \geq 0 \rightarrow [x] \geq 4$ $II: 2-[x] \geq 0 \rightarrow [x] \leq 2$

$[x] \geq 4$ $[x] \leq 2$

(۲- الف) $\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{\pi}{4} = \frac{1}{2} + (-1) + 2(-1) = -\frac{5}{2} \in (-2, 5)$

(۸- ب) $y = \sqrt{\frac{n^3 - 2n^2 - 5n + 4}{n^3 + 2n^2 - 5n - 4}} \gtrsim \frac{n^3 - 2n^2 - 5n + 4}{n^3 + 2n^2 - 5n - 4} \geq 0 \rightarrow$

مخواب منفی پذیر بر (n-1)
مخواب ندان زوج و فرد برابر منفی پذیر بر (n+1)

$$\frac{(n-1)(n^2 - n - 4)}{(n+1)(n^2 + n - 4)} \geq 0 \rightarrow \frac{(n-1)(n-3)(n+2)}{(n+1)(n+3)(n-2)} \geq 0 \rightarrow$$

$\begin{array}{ccccccc} -3 & -2 & -1 & | & 2 & 3 \\ + & - & + & - & + & - & + \end{array}$

$\Rightarrow \mathcal{D}_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$