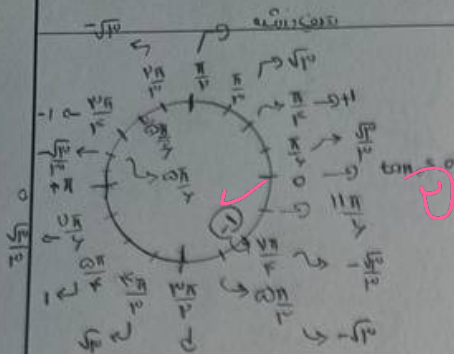


نام و نام خانوادگی



۱

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

۲) $\cot \frac{\pi}{10} + \cot \frac{6\pi}{10} - \tan \frac{3\pi}{4} = \frac{-\sqrt{3}}{10} + 10 \left(\frac{\sqrt{3}}{10} \right) - \sqrt{2} = \frac{-\sqrt{3} + 10\sqrt{3} - 10\sqrt{2}}{10} = \frac{9\sqrt{3} - 10\sqrt{2}}{10}$

۲

۳) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{10}) = \cos(0) + \sin(\pi \cos \frac{\pi}{10}) = 1 + \sin(\pi \cos \frac{\pi}{10})$

۴) $-\cos \frac{\pi}{4} + \sin \frac{\pi}{10} - \sqrt{2} \sin \frac{\pi}{10} = -\frac{\sqrt{2}}{2} + \sin \frac{\pi}{10} - \sqrt{2} \sin \frac{\pi}{10}$

۳

$$a^2 + 2a \leq pa + a + p$$

$$a^2 + a - p = 0$$

$$a = 1/a = -p \times$$

$$f(x) = \begin{cases} x^2 + 2x & x \geq 1 \\ px + 1 & x < 1 \end{cases} \quad f(1) = 3$$

$$f(x) = \begin{cases} x^2 - b \\ a + px \end{cases}$$

$$|x+1| \geq p \Rightarrow$$

$$-p \leq x \leq -1$$

$$x+1 \geq p \Rightarrow x \geq p-1$$

$$x+1 \leq -p \Rightarrow x \leq -p-1$$

برای

$$x = -p \Rightarrow -p-1 \leq -p-1$$

درصورتی که

$$a+b=25$$

۴

الف) $y = \frac{1}{x^2 - \sum x^p} \Rightarrow x^2(x-2)$

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

ب) $y = \frac{1}{x^2 + px + q + r}$

$x^2(x+2) + (px+2)$

$(x^2+1)(x+2)$

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

همواره (+)

۵

$$\text{a)} \quad y = \sqrt{x^p - 1} + \sqrt{x - p}$$

$$\begin{cases} x^p - 1 \geq 0 \rightarrow x^p \geq 1 \rightarrow x \geq 1 \\ x - p \geq 0 \rightarrow x \geq p \end{cases}$$

$$D_f = [p, +\infty)$$

$$\text{b)} \quad \frac{\sqrt{q - px}}{\sqrt{qx - p}}$$

$$\begin{aligned} q - px \geq 0 &\rightarrow px \leq q \rightarrow x \leq \frac{q}{p} \\ qx - p \geq 0 &\rightarrow x \geq \frac{p}{q} \end{aligned}$$

$$D_f = \left[\frac{p}{q}, \frac{q}{p}\right]$$

$$qx - a \geq 0 \rightarrow x \geq \frac{a}{q}$$

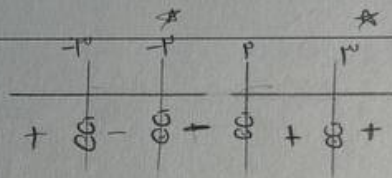
$$\frac{q}{a} \leq p \rightarrow 0 \leq p$$

$$b - cx \geq 0 \rightarrow x \leq \frac{b}{c}$$

$$\frac{b}{c} \leq p \rightarrow 0 \leq p$$

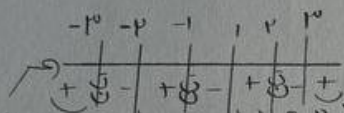
$$b/a = \frac{q}{p} = \left(\frac{1}{p}\right)$$

$$\text{a)} \quad \frac{(x-1)(x+p)}{(x^p-1)(x^p-1)} \geq 0$$



$$D_f = (-\infty, -1) \cup (-p, 1) \cup (p, +\infty)$$

$$\text{b)} \quad \frac{(x-1)(x-1)(x+p)}{(x+1)(x-p)(x+1)}$$



$$\begin{aligned} &\frac{x^0 - px^p - \omega x + \gamma}{x^0 - x^p} \cdot \frac{x-1}{x^p - x - \gamma} \\ &= \frac{-x^p - \omega x + \gamma}{-x^p + x} \cdot \frac{x-1}{x^p - x - \gamma} \\ &= \frac{-x^p + x}{-x^p + x} \cdot \frac{x-1}{x^p - x - \gamma} \end{aligned}$$

$$\begin{aligned} &\frac{x^0 + px^p - \omega x - \gamma}{x^0 + x^p} \cdot \frac{x+1}{x^p - x - \gamma} \\ &= \frac{x^p - \omega x - \gamma}{x^p + x} \cdot \frac{x+1}{x^p - x - \gamma} \end{aligned}$$

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

$$\text{a)} \quad x[x] - p \geq 0 \rightarrow x[x] \geq p \rightarrow x \in [p, +\infty)$$

$$D_f = [p, +\infty)$$

$$\text{b)} \quad x[x] - \omega \geq 0 \rightarrow [x] \geq \frac{\omega}{x} \rightarrow D_f = [p, +\infty)$$

$$\text{a)} \quad \frac{1}{2} \frac{x+1}{|x-p|} \geq 0 \quad D_f = [-1, +\infty) - \{p\}$$

$$\frac{1}{2} \frac{4-x}{(x^p + px + 2)} \geq 0 \quad D_f = (-\infty, 4]$$

$$\omega \rightarrow [-1, p) \cup (p, 4]$$

$$\text{b)} \quad [x] - 2 \geq 0$$

$$[x] \geq 2 \rightarrow x \geq 2$$

$$p - [x] \geq 0 \rightarrow [x] \leq p$$

$$x < p$$

$$D_f = \emptyset$$