

۲. آزمون های نوکس

نوعی از روش
برای پیدا کردن
محدوده
مطلوب

الف) $\rightarrow 2x^3 + 3x^2 - 8x + 3$
 $x-1$ $\rightarrow$ $\frac{2x^3 + 3x^2 - 8x + 3}{x-1}$

$$\begin{array}{r} 2x^3 + 3x^2 - 8x + 3 \\ \underline{2x^3 - 2x^2} \\ 5x^2 - 8x + 3 \\ \underline{5x^2 - 5x} \\ -3x + 3 \\ \underline{-3x + 3} \\ 0 \end{array} \quad \begin{array}{l} x-1 \\ \hline x-1 \end{array} \quad \begin{array}{l} x-1 \\ \hline x-1 \end{array}$$

۱)

$(x-1)(x+3)(2x-1) \rightarrow D_f = R - \left\{ \frac{1}{2}, \frac{1}{3}, 1 \right\}$

ب) $2x^3 + 9x^2 + 10x + 3 \rightarrow \frac{2x^3 + 9x^2 + 10x + 3}{x+1}$

$(x+1)(x+3)(2x+1) \rightarrow D_f = R - \left\{ -\frac{1}{2}, -\frac{1}{3}, -1 \right\}$

$$\begin{array}{r} 2x^3 + 9x^2 + 10x + 3 \\ \underline{2x^3 + 2x^2} \\ 7x^2 + 10x + 3 \\ \underline{7x^2 + 7x} \\ 3x + 3 \\ \underline{3x + 3} \\ 0 \end{array} \quad \begin{array}{l} x+1 \\ \hline x+1 \end{array} \quad \begin{array}{l} x+1 \\ \hline x+1 \end{array}$$

۲)

الف) $\frac{x+1}{(x-1)(x^2-x+1)}$

$D_f = R - \{1\}$

ب) $\frac{x+1}{(x-1)(x^2-x+1)} \geq 0$

$$\begin{array}{r} x^3 - x^2 + x - 1 \\ \underline{x^3 - x^2} \\ x - 1 \\ \underline{x - 1} \\ 0 \end{array} \quad \begin{array}{l} x-1 \\ \hline x-1 \end{array} \quad \begin{array}{l} x-1 \\ \hline x-1 \end{array}$$

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

۳)

$x^3 - \frac{1}{x-1} - 2x + 1 = 0 \rightarrow x \geq 1 \rightarrow x^3 - 2x + 1 = 0 \rightarrow x^3 - 2x + 1 = 0 \rightarrow x = 1, x = -1$

$\rightarrow x \leq 1 \rightarrow x^3 - 2x + 1 = 0 \rightarrow x^3 - 2x + 1 = 0 \rightarrow x = 1, x = -1$

$D_f = R - \{1, -1\}$

$x = 1 \checkmark \quad x = -1 \checkmark$

۴)

الف) $[-x] - p \geq 0 \rightarrow [-x] \geq p \rightarrow -x \geq p \rightarrow x \leq -p \quad D_f = (-\infty, -p]$

ب) $[x]^p - p[x] - p^2 \leq 0 \rightarrow [x] = -1 \rightarrow -1^p - p(-1) - p^2 \leq 0$
 $\rightarrow [x] \leq p \rightarrow p \leq x < p+1$

$D_f = R - \left\{ [-1, 0] \cup [p, p+1] \right\}$

$D_f = (-\infty, -1) \cup [0, p) \cup [p+1, \infty)$

۵)

الف) $\left[x - \frac{1}{p}\right] + \left[x+1 - \frac{1}{p}\right] \leq \left[x - \frac{1}{p}\right] + \left[x - \frac{1}{p}\right] + 1 \geq 0$

$\left[x - \frac{1}{p}\right] \geq -\frac{1}{p} \rightarrow x - \frac{1}{p} \geq 0 \rightarrow x \geq \frac{1}{p}$

ب)

$[a] + [a] \geq 0 \rightarrow a \in \mathbb{Z} \rightarrow a - \frac{1}{p} \in \mathbb{Z} \rightarrow a \in \mathbb{Z} + \frac{1}{p}$

$\left[x - \frac{1}{p}\right] = a$

$0 \leq a < 1 \rightarrow a \geq -\frac{1}{p}$

$D_f = \left[\frac{1}{p}, \infty\right)$

$D_f = \left\{ a \mid a = k + \frac{1}{p}, k \in \mathbb{Z} \right\}$

۶)

الف) $D_f = R - \left\{ \frac{k\pi}{p}, k\pi + \frac{\pi}{p} \right\}$

$\leq k\pi + \frac{\pi}{p}$

ب)

$1 - k \sin^2 \alpha \geq 0 \rightarrow \sin^2 \alpha \leq \frac{1}{k} \rightarrow \frac{1}{k} \leq \sin^2 \alpha \leq 1$

$\rightarrow D_f = \left[k\pi - \frac{\pi}{\sqrt{k}}, k\pi + \frac{\pi}{\sqrt{k}} \right]$

۷)

الف) $k \sin \alpha - 1 \geq 0 \rightarrow \sin \alpha \geq \frac{1}{k} \rightarrow D_f = \left[k\pi + \frac{\pi}{k}, k\pi + \frac{\pi}{k} \right]$

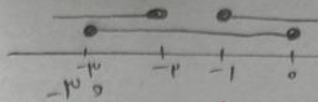
ب)

$1 - p \cos \alpha \geq 0 \rightarrow \cos \alpha \leq \frac{1}{p} \rightarrow D_f = \left[\frac{\pi}{p}, \frac{\pi}{p} \right]$

$R - \left[\frac{\pi}{p}, \frac{\pi}{p} \right]$

①

الف) $x^p + p^n x + 1 \rightarrow -1 \leq x^p + p^n x + 1 \leq 1$



$x^p + p^n x + 1 \geq -1 \rightarrow x^p + p^n x \geq -2 \rightarrow \frac{x^p}{p^n} + x \geq -\frac{2}{p^n} \rightarrow D_f \subset [-1, 0] \cup [-p^n, -p^n]$

ب) $\sqrt{\omega - p^n x} \leq 1 \rightarrow \omega - p^n x \leq 1 \rightarrow -\omega \leq -p^n x \leq -\Sigma \rightarrow D_f \subset [p^n \frac{\omega}{p}, p^n \frac{\omega}{p}]$

② الف) $1 - \log_p x > 0 \rightarrow \log_p x < 1 \rightarrow x < p \rightarrow D_f \subset (0, p)$

ب) $1 - \log_p \frac{1}{x} > 0 \rightarrow \log_p \frac{1}{x} < 1 \rightarrow x > \frac{1}{p} \rightarrow D_f \subset (\frac{1}{p}, +\infty)$

الف) $p^n x - p^n \geq 0 \rightarrow p^n x \geq p^n \rightarrow x \geq 1 \rightarrow D_f \subset [1, p]$

ب) $\frac{p^n x + \omega}{p^n x + p} \in W \rightarrow \frac{-K\omega + \omega}{p^n x + p} \leq 0 \rightarrow D_f \subset \{x | x = \frac{-K\omega + \omega}{p^n x + p}, K \in W\}$