

تکلیف شصت و یکم A از دو جزء تشکیل شده است

$$rx'' + y' - \epsilon x + 4y + k = 0 \rightarrow y' + 4y + \underbrace{(rx'' - \epsilon x + k)}_C = 0$$

$$\Delta = b^2 - 4ac = 16 - 4r(-\epsilon) = 16 + 4\epsilon r \rightarrow -4\epsilon r + 16 = -4((x-1)^2 - 1) = -4(x-1)^2 + 4$$

$$\Delta = \epsilon^2 - 4K - 4(x-1)^2 \leq \epsilon^2 - 4K \rightarrow 0 \geq \epsilon^2 - 4K \rightarrow K \geq \frac{\epsilon^2}{4} \rightarrow \boxed{K=11}$$

$$a^2 + \epsilon a = r a + r \rightarrow a^2 + a - r = 0 \rightarrow \boxed{x=1 \cup 5} \quad x = -2 \cup 5 \quad a > 0$$

$$f(x) = \begin{cases} x^2 + \epsilon x & ; x \geq 1 \\ rx + r & ; x \leq 1 \end{cases} \Rightarrow f(1) = 1 + \epsilon = a$$

$$f(x) = \begin{cases} rx^2 - b & ; |x+1| \geq r \\ a^2 + rx & ; -r \leq x \leq -1 \end{cases} \quad \begin{aligned} r(-r)^2 - b &= a + r(-r) \\ 1a - b &= a - r \rightarrow a + b = 1a + r = r\epsilon \end{aligned}$$

$$4x - a \geq 0 \rightarrow x \geq \frac{a}{4} \quad b - rx \geq 0 \quad x \leq \frac{b}{r}$$

$$\Rightarrow D_f = \left[\frac{a}{4}, \frac{b}{r}\right] = \{r\} \rightarrow \frac{a}{4} = \frac{b}{r} = r \rightarrow a = 1r \quad b = r \quad \frac{b}{a} = \frac{r}{1r} = \frac{1}{r}$$

$$\text{الف)} \frac{x+1}{|x-3|} \geq 0 \quad \begin{array}{c|c} x & -1 \quad 3 \\ \hline & - \quad + \quad + \end{array} \quad D = [-1, 3) \cup (3, +\infty) \quad (I)$$

$$\frac{4-x}{x^2+rx+\epsilon} \geq 0 \quad \begin{array}{c|c} x & 4 \\ \hline & + \quad - \end{array} \quad D = (-\infty, 4] \quad (II) \quad (I) \cap (II) = [-1, 3) \cup (3, 4]$$

$$\text{ب)} [x] \in \mathbb{Z} \geq 0 \rightarrow [x] \geq 5 \rightarrow x \geq 5 \quad D = [5, +\infty) \quad (I)$$

$$r - [x] \geq 0 \rightarrow [x] \leq r \rightarrow x < r \quad D = (-\infty, r) \quad (II)$$

$$(I) \cap (II) = \emptyset$$

$$t = x^r$$

فرض کنیم

الف) $x^r - 13x^r + 34 = t^r - 13t + 34 = 0 \quad t=9 \rightarrow x_1 = \pm 3 \quad t_2 = 6 \rightarrow x_2 = \pm 2$
 $x^r - x - 4 \rightarrow x = -2 \quad x = 3$

$\frac{x^r - x - 4}{x^r - 13x^r + 34} \geq 0$	x	-3	-2	2	3	$D = (-\infty, -2) \cup (2, 3) \cup (3, +\infty)$
		$+$	$-$	$-$	$+$	

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

x	-3	-2	-1	1	2	3	$D = (-\infty, -3) \cup [-2, -1] \cup [1, 2) \cup [3, +\infty)$
	$+$	$-$	$+$	$-$	$+$	$-$	

الف) $[-x] - 2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow x \leq -2 \rightarrow D = (-\infty, -2]$

ب) $[x]^r - 2[x] - 2 = n \rightarrow n^r - 2n - 2 \neq 0 \rightarrow (n-2)(n+1) \neq 0 \quad n \neq 2 \quad n \neq -1$

$[x] \neq 2 \Rightarrow (-\infty, 2) \cup (2, +\infty)$ (1) $[x] \neq -1 \Rightarrow D = (-\infty, -1] \cup (0, +\infty)$ (2)

(1) $\cap$ (2) $= (-\infty, -1] \cup (0, 2) \cup (2, +\infty)$ دامنه صورت IR بود و تأییدی نداشت.

الف) $\begin{cases} \sin x \neq 0 & x \neq k\pi \\ \cos x \neq 0 & x \neq k\pi + \frac{\pi}{2} \\ \tan x + 1 \neq 0 \rightarrow \tan x \neq -1 & x \neq k\pi + \frac{3\pi}{4} \end{cases} \Rightarrow D = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{4} \right\}$

ب) $1 - \epsilon \sin^2 x \geq 0 \rightarrow \epsilon \sin^2 x \leq 1 \rightarrow \sin^2 x \leq \frac{1}{\epsilon}$ (1)

ج. پ = (1) $\cap$ (2) $= \left[0, \frac{1}{\epsilon} \right]$

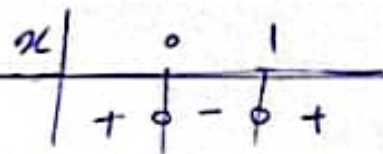
$0 \leq \sin^2 x \leq 1$ (2)

الف) $\begin{cases} x-1 > 0 \rightarrow x > 1 & (1) \\ 1 - \log \frac{x-1}{\frac{1}{r}} \geq 0 \rightarrow \log \frac{x-1}{\frac{1}{r}} \leq 1 \rightarrow x-1 \leq \frac{1}{r} \rightarrow x \leq \frac{r}{r} & (2) \end{cases}$

(1) $\cap$ (2) $= \left(1, \frac{r}{r} \right]$

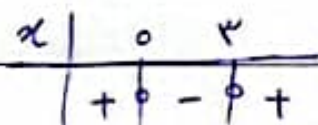
(1) $\frac{1}{x} \leq \frac{1}{x-1}$

$$1) \quad x^r - x \geq 0 \rightarrow x(x-1) \geq 0$$



$$D = (-\infty, 0] \cup [1, +\infty) \quad (1)$$

$$x^r - rx \geq 0 \rightarrow x(x-r) \geq 0$$



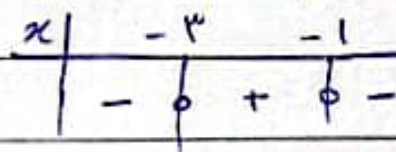
$$D = (-\infty, 0) \cup (r, +\infty) \quad (r)$$

$$1 - \log_{\frac{1}{x}} \frac{x^r - rx}{x} \neq 0 \rightarrow \log_{\frac{1}{x}} \frac{x^r - rx}{x} \neq 1 \rightarrow x^r - rx \neq x \rightarrow x^r - rx \neq 0 \rightarrow D = \mathbb{R} - \{x, 1\} \quad (x)$$

$$(1) \cap (r) \cap (x) = (-\infty, -\epsilon) \cup (-\epsilon, 0) \cup (r, +\infty)$$

$$1) \quad r^{\frac{1}{x}} - x^r \geq 0 \rightarrow r^{\frac{1}{x}} - x^r \geq r^{\frac{1}{r}} \rightarrow \frac{1}{x} - x^r \geq \frac{1}{r}$$

$$-x^r + \frac{1}{x} \geq \frac{1}{r} \rightarrow -(x^r - \frac{1}{x}) \geq \frac{1}{r} \rightarrow x^r - \frac{1}{x} \leq -\frac{1}{r}$$



$$D = [-1/r, -1]$$

$$1) \quad \frac{rx + \omega}{rx + \epsilon} \in W \rightarrow rx + \omega \in rxW + \epsilon W \rightarrow rx \in rxW + \epsilon W - \omega \rightarrow x \in \frac{\epsilon W - \omega}{r - rW}$$

$$\rightarrow \left\{ x \mid x = \frac{\epsilon K - \omega}{r - rK}, K \in W \right\}$$