

الف) $\frac{x^2-4}{x^2-x} \geq 0 \Rightarrow \frac{x(x-4)}{x(x-1)} \geq 0$ ب) $\frac{x^5-x^3}{x^4-x} \geq 0 \Rightarrow \frac{x^3(x^2-1)}{x(x^2-1)} \geq 0$	$-1 \quad 0 \quad 1 \quad 4$ $- \quad + \quad + \quad - \quad +$ $\frac{-}{+} \quad \frac{+}{+} \quad \frac{+}{+} \quad \frac{-}{+}$ $D = (-1, 1) \cup [4, +\infty)$ $-1, 0, 1, 4$ $-1 \quad 0 \quad 1$ $+ \quad + \quad +$ $\frac{-}{+} \quad \frac{+}{+} \quad \frac{+}{+}$ $D = \mathbb{R} - \{\pm 1, 0\}$	۱
الف) $x + x > 0$ $\begin{cases} x > 0 \Rightarrow x = x \Rightarrow 2x > 0 \Rightarrow x > 0 \checkmark \\ x < 0 \Rightarrow x = -x \Rightarrow x + (-x) = 0 \times \end{cases}$ ب) $x x > 0$ $\begin{cases} x > 0 \Rightarrow x = x \Rightarrow x x = x^2 > 0 \checkmark \\ x < 0 \Rightarrow x = -x \Rightarrow x x = -x^2 < 0 \times \end{cases}$	$D = (0, +\infty)$ $(2) \checkmark$ $D = (0, +\infty)$	۲
الف) $2 - [x] \geq 0 \Rightarrow 2 \geq [x] \Rightarrow D = (-\infty, 3)$ ب) $2 - [x] > 0 \Rightarrow 2 > [x] \Rightarrow D = (-\infty, 2)$	$(2) \checkmark$	۳
الف) $[x - \frac{1}{3}] + [x + \frac{2}{3}] \geq 0$ $[x + \frac{2}{3}] = [x - \frac{1}{3}] + 1 \Rightarrow 2[x - \frac{1}{3}] + 1 \geq 0$ $[x - \frac{1}{3}] \geq 0 \Rightarrow x - \frac{1}{3} \geq 0 \Rightarrow x \geq \frac{1}{3} \Rightarrow D = [\frac{1}{3}, +\infty)$ ب) $[x - \frac{1}{3}] + [-x + \frac{1}{3}] \geq 0$ $x - \frac{1}{3} = a \quad [a] + [-a] = \begin{cases} 0 & a \in \mathbb{Z} \checkmark \\ -1 & a \notin \mathbb{Z} \times \end{cases}$	$\Rightarrow x - \frac{1}{3} \in \mathbb{Z} \Rightarrow D = \{n + \frac{1}{3} \mid n \in \mathbb{Z}\}$ $(2) \checkmark$	۴
الف) $\sin^{-1} \neq 0 \Rightarrow \sin \neq 1 \Rightarrow D = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$ ب) $2\sin^2 x - 1 \neq 0 \Rightarrow \sin^2 x \neq \frac{1}{2} \Rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2} \Rightarrow D = \mathbb{R} - \{\frac{k\pi}{2} + \frac{\pi}{4}\}$	$(2) \checkmark$  	۵

الف) $\sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{1} \Rightarrow D = [2k\pi + \frac{\pi}{2}, 2k\pi + \frac{5\pi}{2}]$



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ب) $\cos x - 1 \geq 0 \Rightarrow \cos x \geq 1 \Rightarrow D = \{2k\pi\}$



الف) $-1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow D = [-4, -2] \cup [2, 4]$

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ب) $-1 \leq x^2 + 3x + 1 \leq 1$ 1, 1.5 مبدل نيسن علامت بجديتي

$\begin{cases} -1 \leq x^2 + 3x + 1 \Rightarrow 0 \leq x^2 + 3x + 2 \Rightarrow 0 \leq (x+1)(x+2) \\ x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0 \end{cases}$

$x \leq -2, x \geq -1$ -2 -1
+ - - +

$D = [-2, -1] \cup [0, 3]$

الف) $2 - \log_3(x-2) \geq 0 \Rightarrow \log_3(x-2) \leq 2 \Rightarrow \begin{cases} x-2 \leq 9 \Rightarrow x \leq 11 \\ x-2 > 0 \Rightarrow x > 2 \end{cases}$

$D = (2, 11]$

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ب) $\log(x^2 - x) \geq 0 \Rightarrow x^2 - x \geq 1 \Rightarrow x(x-1) \geq 1 \Rightarrow x(x-1)(x+1) \geq 0 \Rightarrow x = 0, \pm 1$

$\begin{matrix} -1 & 0 & 1 \\ + & - & + \\ - & + & - \end{matrix} \Rightarrow D = (-\infty, -1) \cup (0, 1)$

الف) $4^x + 1 \neq 0 \Rightarrow 4^x \neq -1 \Rightarrow D = \mathbb{R}$

ب) $4^x - 1 \neq 0 \Rightarrow 4^x \neq 1 \Rightarrow D = \mathbb{R} - \{0\}$

ج) $4^x - 2 \neq 0 \Rightarrow 4^x \neq 2 \Rightarrow D = \mathbb{R} - \{\frac{1}{2}\}$

د) $4^x - 3 \neq 0 \Rightarrow 4^x \neq 3 \Rightarrow \log_4 3 = x \Rightarrow D = \mathbb{R} - \{\log_4 3\}$

و) $4x + 1 \in W \Rightarrow x = \frac{W-1}{4} \Rightarrow D = \{x \mid x = \frac{k-1}{4}, k \in W\}$

ب) $\frac{3x-2}{2x-1} \in W \Rightarrow 3x-2 = 2Wx-1 \Rightarrow 3x-2Wx = -1W+2$

$x = \frac{-1W+2}{3-2W} \Rightarrow D = \{x \mid \frac{\Delta k - 2}{2k - 3}, k \in W\}$

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