

الف) $\frac{x^3 + 1x^2 - 1x + 1}{-x^3 + 1x^2} \rightarrow \frac{x-1}{x^2 + 5x - 1} \rightarrow y = \frac{(x+1)}{(x-1)(x^2 + 5x - 1)} = \frac{(x+1)}{(x-1)(x+1)(x-\frac{1}{5})} \rightarrow D_f = \mathbb{R} - \{1, -\frac{1}{5}, \frac{1}{5}\}$

ب) $\frac{x^3 + 9x^2 + 10x + 1}{x^3 + 1x^2} \rightarrow \frac{x+1}{x^2 + 7x + 1} \rightarrow y = \frac{x+1}{(x+1)(x+7)} = \frac{(x+1)}{(x+1)(x+7)} \rightarrow D_f = \mathbb{R} - \{-1, -\frac{1}{7}, \frac{1}{7}\}$

الف) $\frac{x^4 - 1x^3 + 1x^2 - 1}{-x^2 + 1x} \rightarrow \frac{x-1}{x^2 - x + 1} \rightarrow y = \frac{x+1}{(x-1)(x^2 - x + 1)} \rightarrow D_f = \mathbb{R} - \{1\}$

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

ب) $[x] = \frac{2 \pm \sqrt{4+12}}{2} = \frac{2 \pm 4}{2} \Rightarrow \begin{cases} [x] = 3 \\ [x] = -1 \end{cases}$

$\rightarrow [x] = 3 \rightarrow [3, 4) \text{ I}$

$\rightarrow [x] = -1 \rightarrow [-1, 0) \text{ II}$

$R - (I \cup II) \rightarrow D_f = (-\infty, -1) \cup [0, 3) \cup [4, +\infty)$

الف) $[x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 0$

$[x - \frac{1}{x} + 1] + [x + \frac{1}{x}] \geq 1$

$2[x + \frac{1}{x}] \geq 1$

$[x + \frac{1}{x}] \geq \frac{1}{2}$

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

ب) $x - \frac{1}{x} = a \rightarrow \sqrt{[a] + [-a]}$

$a \in \mathbb{Z} \rightarrow [a] + [-a] = 0$

$a \in \mathbb{Z} \rightarrow [a] + [-a] = -1$

$\rightarrow x - \frac{1}{x} \in \mathbb{Z} \rightarrow D_f = \{x | x = k + \frac{1}{x}, k \in \mathbb{Z}\}$

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$x \in \mathbb{Z} + \frac{1}{x}$

الف) $\tan x + 1 \neq 0$

$\begin{cases} \tan x \neq -1 \rightarrow \\ \sin x \neq 0 \\ \cos x \neq 0 \end{cases}$



$D_f = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4} \right\}$

ب) $1 - k \sin^2 x > 0$

$k \sin^2 x < 1$
 $\sin^2 x < \frac{1}{k}$

$-\frac{1}{\sqrt{k}} < \sin x < \frac{1}{\sqrt{k}}$



$\rightarrow D_f = \left[k\pi - \frac{\pi}{2}, k\pi + \frac{\pi}{2} \right]$

الف) $k \sin x - 1 > 0$

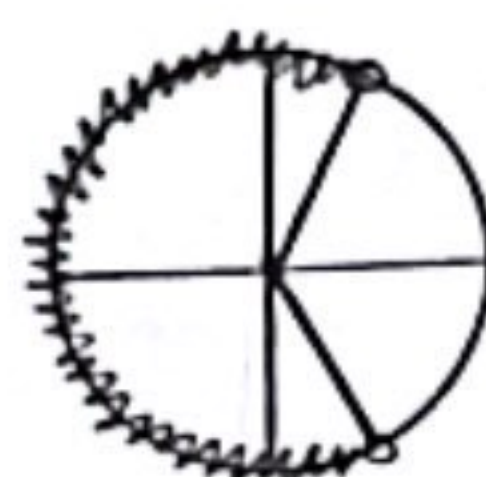
$\sin x > \frac{1}{k} \rightarrow \frac{1}{k} < \sin x < 1$



$D_f = \left[2k\pi + \frac{\pi}{2}, 2k\pi + \frac{\pi}{2} \right]$

$1 - k \cos x > 0$

$\cos x < \frac{1}{k} \rightarrow -1 < \cos x < \frac{1}{k}$

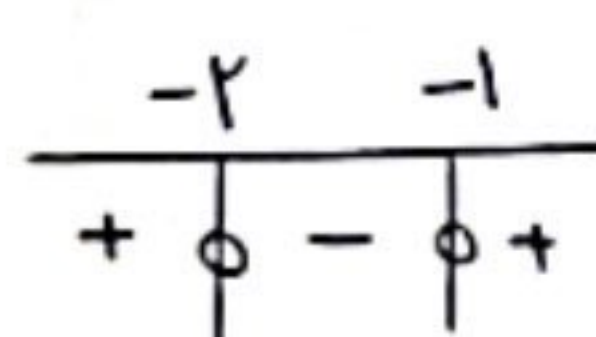


$D_f = \mathbb{R} - \left(2k\pi - \frac{\pi}{2}, 2k\pi + \frac{\pi}{2} \right)$

الف) $-1 < x^2 + kx + 1 < 1$

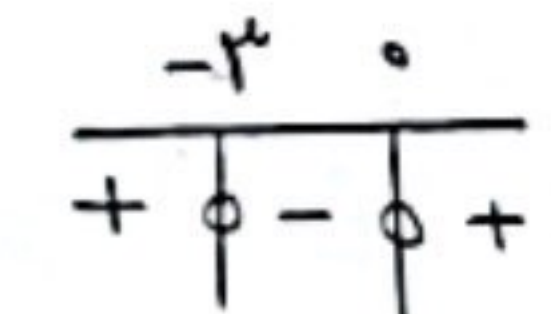
$x^2 + kx + 1 > 0$

$(x+1)(x+1) > 0$



$x^2 + kx < 0$

$x(x+k) < 0$



$\Rightarrow D_f = [-k, -1] \cup [-1, 0]$

ب) $-1 < \sqrt{\omega - kx} < 1$

$\rightarrow \omega - kx < 1 \rightarrow kx > \omega - 1 \rightarrow x > \frac{\omega - 1}{k}$

$\rightarrow \omega - kx > 0 \rightarrow kx < \omega \rightarrow x < \frac{\omega}{k}$

$D_f = \left[\frac{\omega - 1}{k}, \frac{\omega}{k} \right]$

الف) $x > 0$

$1 - \log_k x > 0 \rightarrow \log_k x < 1 \rightarrow x < k$

$\rightarrow D_f = (0, k)$

ب) $x > 0$

$1 - \log_{\frac{1}{k}} x > 0 \rightarrow \log_{\frac{1}{k}} x < 1$

$\rightarrow x > \frac{1}{k}$

$\rightarrow D_f = \left(\frac{1}{k}, +\infty \right)$

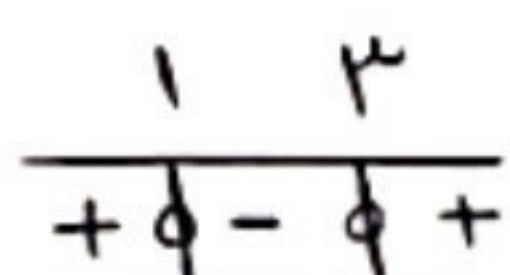
الف) $kx - x^2 > 0$

$kx - x^2 > 0$

$\rightarrow kx - x^2 > 0$

$x^2 - kx + k < 0$

$(x-k)(x-1) < 0$



ب) $\frac{kx + \omega}{kx + k} \in \omega$

$x = -\frac{k\omega - \omega}{k\omega - k}$

$D_f = \left\{ x / x = \frac{\omega - k}{k\omega - k}, k \in \omega \right\}$

$\rightarrow D_f = [1, k]$