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الف) $\frac{x(x^4-4)}{x(x-1)(x+1)} = \frac{-1}{x} + \frac{1}{x-1} + \frac{1}{x+1} + \frac{6}{x^4} \quad D_f = (-1, 0) \cup (0, 1) \cup (1, +\infty)$

✓

ب) $\frac{x^3(x-1)(x+1)}{x(x-1)(x+1)} = \frac{-1}{x} + \frac{1}{x-1} + \frac{1}{x+1} + \frac{1}{x} \quad D_f = (-\infty, -1) \cup (-1, 0) \cup (0, 1) \cup (1, +\infty)$

الف) $x+|x| > 0 \rightarrow |x| > -x \rightarrow D_f = \mathbb{R}^+$

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ب) $x|x| > 0 \rightarrow D_f = \mathbb{R}^+$

⊖ α
⊙ α
⊕ ✓

✓

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

ب) $2-[x] > 0 \rightarrow 2 > [x] \rightarrow D_f = (-\infty, 2)$

✓

الف) $\left\lfloor x + \frac{1}{r} \right\rfloor + \left\lfloor x + \frac{1}{r} \right\rfloor \geq 1 \rightarrow \left\lfloor x + \frac{1}{r} \right\rfloor \geq \frac{1}{r}$

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بعد از ۱/r است

$x + \frac{1}{r} \geq 1 \rightarrow x \geq \frac{1}{r}$

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ب) $\left\lfloor x - \frac{1}{r} \right\rfloor + \left\lfloor -x + \frac{1}{r} \right\rfloor \geq 0$
 $\left\lfloor x - \frac{1}{r} \right\rfloor + \left\lfloor -(x - \frac{1}{r}) \right\rfloor$
 $D_f = \left\{ x \mid x = k + \frac{1}{r}, k \in \mathbb{Z} \right\}$

$\begin{cases} a \in \mathbb{Z} & [a] + [-a] = 0 \\ a \notin \mathbb{Z} & [a] + [-a] = -1 \end{cases} \quad \begin{matrix} x - \frac{1}{r} \in \mathbb{Z} \\ x \in \mathbb{Z} + \frac{1}{r} \end{matrix}$

الف) $\sin x - 1 \neq 0$
 $\sin x \neq 1$



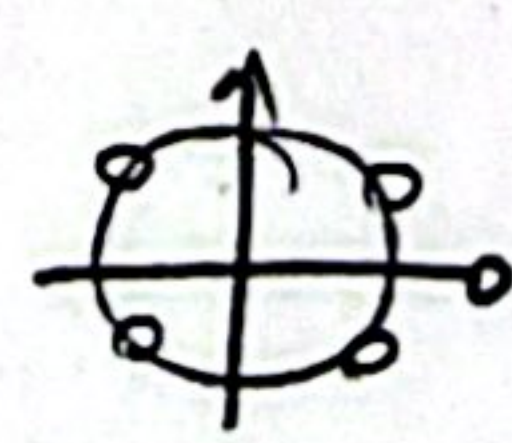
$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{2} \right\}$

✓

ب) $\sin^2 x - 1 \neq 0$

$\sin^2 x \neq 1$

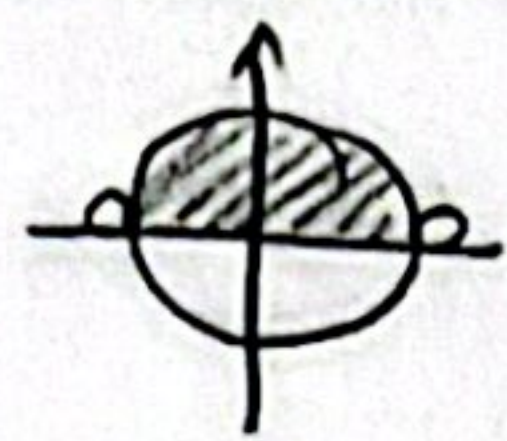
$\sin^2 x \neq \frac{1}{r} \rightarrow \sin x \neq \pm \sqrt{\frac{1}{r}} \rightarrow \sin x \neq \pm \frac{\sqrt{r}}{r}$



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

الف) $2\sin x - 1 \geq 0$

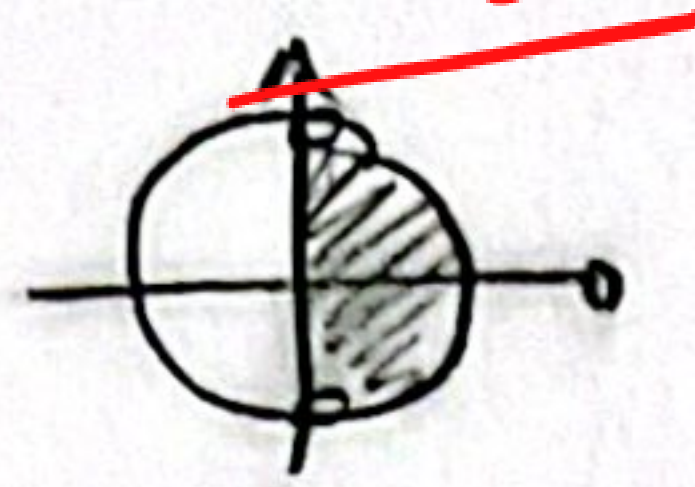
$2\sin x \geq 1 \rightarrow \sin x \geq \frac{1}{2}$



$D_f = (2k\pi, 2k\pi + \pi)$

ب) $\cos x - 1 \geq 0$

$\cos x \geq 1$



$D_f = (2k\pi + \frac{\pi}{2}, 2k\pi - \frac{\pi}{2})$

$2k\pi$

لنفرض $x = 2k\pi$

الف) $|n| - 3 \leq 1 \rightarrow -1 \leq |n| - 3 \leq 1 \rightarrow 2 \leq |n| \leq 4$

$-2 \leq n \leq -4$
 $2 \leq n \leq 4$

$D_f = [-2, -4] \cup [2, 4]$

(2) ✓

ب) $-1 \leq n^2 + 3n + 1 \leq 1 \rightarrow -1 \leq n^2 + 3n + 1 \rightarrow n^2 + 3n + 2 \geq 0$

$(n+1)(n+2) \geq 0$

$n^2 + 3n + 1 \leq 1 \rightarrow n^2 + 3n \leq 0 \rightarrow n(n+3) \leq 0$

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

الف) $x - 2 > 0 \rightarrow x > 2$

$2 - \log_2^{x-2} \geq 0 \rightarrow 2 \geq \log_2^{x-2} \rightarrow x - 2 \leq 4 \rightarrow x \leq 6$

$D_f = (2, 6]$

(1, 6)

ب) $n^3 - n > 0$

$n(n-1)(n+1) > 0$

$\frac{-1 \ 0 \ 1}{- \ + \ - \ +}$

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

الف) $\varepsilon^n + 1 \neq 0 \rightarrow \varepsilon^n \neq -1 \rightarrow D_f \in \mathbb{R}$

ب) $\varepsilon^n - 1 \neq 0 \rightarrow \varepsilon^n \neq 1 \rightarrow n \neq 0 \rightarrow D_f = \mathbb{R} - \{0\}$

ج) $\varepsilon^n - 2 \neq 0 \rightarrow \varepsilon^n \neq 2 \rightarrow n \neq \log_2 \varepsilon \rightarrow D_f = \mathbb{R} - \{\log_2 \varepsilon\}$

د) $\varepsilon^n - 3 \neq 0 \rightarrow \varepsilon^n \neq 3 \rightarrow n \neq \log_3 \varepsilon \rightarrow D_f = \mathbb{R} - \{\log_3 \varepsilon\}$

الف) $\varepsilon n + 1 \in \omega \rightarrow \varepsilon n \in \omega - 1 \rightarrow n \in \frac{\omega - 1}{\varepsilon}$

$D_f = \{n \mid n = \frac{k-1}{\varepsilon}, k \in \omega\}$

ب) $\frac{3n-2}{2n-5} \in \omega \rightarrow 3n-2 \in 2n-5\omega$

$-2n\omega + 3n \in 2-5\omega$

$n(3-2\omega) \in 2-5\omega \rightarrow n \in \frac{2-5\omega}{3-2\omega}$

$D_f = \{n \mid n = \frac{2-5k}{3-2k}, k \in \omega\}$