

الف) $\frac{x(x-4)}{x(x^2-1)} \geq 0$

$$\frac{-1}{-1} \frac{0}{0} \frac{1}{1} \frac{4}{4} \frac{+}{+}$$

$D_f = (-1, 0) \cup (0, 4) \cup [4, +\infty)$

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

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

$D_f = \mathbb{R} - \{0, -1\}$

الف) $x + |x| > 0$ $D_f = \mathbb{R} - [0, -\infty)$

$|x| > -x$

ب) $x|x| > 0$ $D_f = \mathbb{R} - [0, -\infty)$

الف) $\lfloor x \rfloor \geq 0 \rightarrow \lfloor x \rfloor \geq 0$ $D_f = (-\infty, 3)$

ب) $\lfloor x \rfloor > 0 \rightarrow \lfloor x \rfloor > 0$ $D_f = (-\infty, 2)$

$\lfloor x \rfloor \geq 0$

الف) $\sqrt{\lfloor x + \frac{1}{x} \rfloor + \lfloor x - \frac{1}{x} \rfloor} \geq 0$

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

$\rightarrow \lfloor x - \frac{1}{x} \rfloor + 1 = \lfloor x + \frac{1}{x} \rfloor \rightarrow \lfloor x - \frac{1}{x} \rfloor + 1 \geq 0 \rightarrow \lfloor x - \frac{1}{x} \rfloor \geq -1 \rightarrow x \geq \frac{1}{x}$

$\{x \mid x + \frac{1}{x} \geq 0, x \in \mathbb{Z}\}$

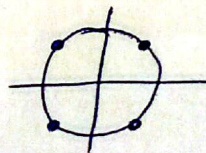
ب) $\lfloor x - \frac{1}{x} \rfloor + \lfloor -x + \frac{1}{x} \rfloor \geq 0 \rightarrow x - \frac{1}{x} \in \mathbb{Z} \rightarrow D_f = \{x + \frac{1}{x} \mid x \in \mathbb{Z}\}$

الف) $\sin x - 1 = 0 \rightarrow \sin x = 1$ $D_f = \mathbb{R} - \{2K\pi + \frac{\pi}{2}\}$

$\sin x = 1$

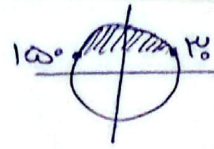
ب) $\sqrt{2} \sin^2 x - 1 = 0 \rightarrow \sin^2 x = \frac{1}{2}$

$\sin x = \pm \frac{\sqrt{2}}{2}$



$D_f = \mathbb{R} - \{\frac{K\pi}{2} + \frac{\pi}{4}\}$

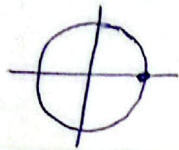
الف) $2\sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{2}$



$D_f = [2K\pi + \frac{\pi}{6}, 2K\pi + \frac{5\pi}{6}]$

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ب) $\cos x \geq 1$



✓

$D_f = \{2K\pi\}$

الف) $-1 \leq |x-3| \leq 1 \rightarrow |x| \leq 4 \rightarrow x = [-4, 4]$

$\hookrightarrow -1 \leq |x-3| \rightarrow 2 \leq |x| \rightarrow x = (-\infty, -2] \cup [2, +\infty)$

$D_f = [-4, -2] \cup [2, 4]$ $-1 \leq x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0$

ب) $D_f = [-3, -2] \cup [-1, 0]$ $x^2 + 3x + 1 \geq -1 \rightarrow (x+1)(x+2) \geq 0$ $x \leq -2$ or $x \geq -1$

الف) $x-2 > 0 \rightarrow x > 2$ $2 - (\log_3(x-2)) \geq 0 \rightarrow 2 \geq \log_3(x-2) \rightarrow 9 \geq x-2 \rightarrow 11 \geq x$ $D_f = (2, 11]$

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ب) $x^3 - x > 0$

$x(x^2 - 1) > 0 \rightarrow x(x-1)(x+1) > 0$ $D_f = (-1, 0) \cup (1, +\infty)$

الف) $4^x + 1 = 0 \rightarrow 4^x = -1$ هیچگاه منفی نمی شود. $D_f = \emptyset$

ب) $4^x - 1 = 0 \rightarrow 4^x = 1 \rightarrow x = 0 \rightarrow D_f = \mathbb{R} - \{0\}$

ج) $4^x - 2 = 0 \rightarrow 4^x = 2 \rightarrow x = \frac{1}{2} \rightarrow D_f = \mathbb{R} - \{\frac{1}{2}\}$

د) $4^x - 3 = 0 \rightarrow 4^x = 3 \rightarrow x = \log_4 3 \rightarrow D_f = \mathbb{R} - \{\log_4 3\}$

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الف) $4x+1 \in \omega \rightarrow 4x \in \omega \neq 1 \rightarrow x \in \frac{\omega-1}{4}$

$D_f = \{x | x = \frac{k-1}{4}, k \in \omega\}$

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

$D_f = \{x | x = \frac{-5k+2}{3-2k}, k \in \omega\}$ $x \in \frac{-5\omega+2}{3-2\omega}$

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