

نام و نام خانوادگی: ... امیر حبیب ... زوار ... پاسخنامه تشریحی تکلیف شماره ۴ ... کلاس ... دبیر ...

$\frac{x^5 - x^3}{x^3 - x} > 0 \Rightarrow \frac{x^3(x-1)(x+1)}{x(x-1)(x+1)}$ $\Rightarrow \frac{x^3}{x} = x^2 > 0 \Rightarrow \text{همیشه هست}$ $\Rightarrow x(x-1)(x+1) \neq 0 \quad (\text{این صفرها را حذف می‌کنیم})$ $D_f = \mathbb{R} - \{-1, 0, 1\}$	(الف) $(x^4 - 4x) = x(x^3 - 4) \quad x = (0, \frac{4}{\sqrt[3]{3}})$ $(x^3 - 4) = x(x^2 - \frac{4}{x}) \neq 0 \Rightarrow x \neq (-1, 0, 1)$ $D_f = (-1, 0) \cup (0, 1) \cup (1, \frac{4}{3}) \cup (\frac{4}{3}, \infty)$
$x x > 0$ $x > 0 \Rightarrow x = x \Rightarrow x x = x^2$ $x < 0 \Rightarrow -x = x \Rightarrow -x x = -x^2$ همواره مثبت $D_f = (0, +\infty)$	(الف) $x + x > 0$ $x < 0 \Rightarrow x + x = 0$ $x > 0 \Rightarrow x + x = 2x$ $D_f = (0, +\infty)$
$2 - [x] > 0, 2 - [x] \neq 0$ $\Rightarrow 2 - [x] > 0$ $\Rightarrow [x] < 2 \Rightarrow x < 2$ $D_f = (-\infty, 2)$	(الف) $y = \sqrt{2 - [x]}$ $2 - [x] > 0 \Rightarrow [x] < 2$ $\Rightarrow x < 3$ $D_f = (-\infty, 3)$
$[a] + [-a] = 0 \quad \text{if } a \in \mathbb{Z}$ $[a] + [-a] = -1 \quad \text{if } a \notin \mathbb{Z}$ $x - \frac{1}{x} \in \mathbb{Z} \Rightarrow x = z + \frac{1}{x}$ $D_f \in [x x = z + \frac{1}{x}, z \in \mathbb{Z}]$	(الف) $[x + \frac{1}{x}] + [x - \frac{1}{x}] > 0$ $[x + \frac{1}{x}] + [x + \frac{1}{x}] > 1$ $2[x + \frac{1}{x}] > 1 \Rightarrow [x + \frac{1}{x}] > \frac{1}{2}$
$2 \sin^2 x - 1 \neq 0 \Rightarrow 2 \sin^2 x \neq 1$ $\Rightarrow \sin^2 x \neq \frac{1}{2}$ $\Rightarrow \sin x \neq \pm \frac{1}{\sqrt{2}}$ $\sin x \neq \pm \frac{\sqrt{2}}{2} \quad D_f = \mathbb{R} - \{\frac{\pi}{4} + \frac{\pi}{2}k, \frac{3\pi}{4} + \frac{\pi}{2}k\}$	(الف) $\sin x - 1 \neq 0 \Rightarrow \sin x \neq 1$ $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

$\cos x - 1 > 0 \Rightarrow \cos x > 1 \Rightarrow$ $\cos = [1, -1] \leftarrow D_f = \{2k\pi\}$	(الف) $ \sin x - 1 > 0 \Rightarrow \sin x < 1$ $\sin x > \frac{1}{2}$ $D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$
$-1 < x^2 + 3x + 1 \leq 1$ $x^2 + 3x + 1 > -1 \Rightarrow x^2 + 3x + 2 > 0 \Rightarrow (x+1)(x+2) > 0$ $x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0$ $D_f = [-3, -1] \cup [0, 1]$	(الف) $-1 < x^2 \leq 1$ $\Rightarrow 1 < x \leq \sqrt{2}$ $D_f = [-\sqrt{2}, -1] \cup [1, \sqrt{2}]$
$x^2 - x > 0 \Rightarrow x(x-1) > 0$ $\Rightarrow x(x-1)(x+1) > 0$ $D_f = (-1, 0) \cup (1, \infty)$	(الف) $x - \log(x^2) > 0$ $\Rightarrow \log(x^2) < x$ $\Rightarrow x - 2 < 0$ $\Rightarrow x < 2$ $D_f = (-\infty, 2)$
$\sum x \neq 0 \Rightarrow \sum x \neq 3$ $\Rightarrow x \neq \log_3 3$ $D_f = \mathbb{R} - \{\log_3 3\}$	(الف) $\sum x - 1 \neq 0 \Rightarrow \sum x \neq 1$ $\Rightarrow x \neq 0$ $D_f = \mathbb{R} - \{0\}$
$\frac{x}{x-1} \in \mathbb{W} \Rightarrow \frac{x}{x-1} \in \mathbb{W} - \frac{1}{x-1}$ $\Rightarrow \frac{x}{x-1} - \frac{1}{x-1} \in \mathbb{W}$ $\Rightarrow \frac{x-1}{x-1} \in \mathbb{W}$ $\Rightarrow x = \frac{1-\Delta\mathbb{W}}{1-\mathbb{W}} \Rightarrow D_f = \{x \mid \frac{1-\Delta\mathbb{W}}{1-\mathbb{W}}, k \in \mathbb{W}\}$	(الف) $\sum x + 1 \in \mathbb{W}$ $\sum x \in \mathbb{W} - 1$ $x \in \frac{\mathbb{W}-1}{\sum}$ $D_f = \{x \mid x = \frac{k-1}{\sum}, k \in \mathbb{W}\}$