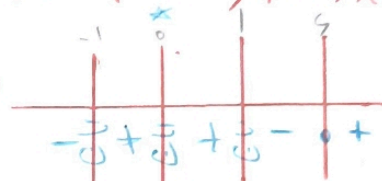


نام و نام خانوادگی: ... امیرحسین ... شماره: 4 کلاس: ... 19, 175

$\frac{x^3 - x^2}{x^2 - x} > 0 \Rightarrow \frac{x^2(x-1)(x+1)}{x(x-1)(x+1)}$ $\Rightarrow \frac{x^2}{x} = x > 0 \Rightarrow \text{همیشه هست}$ $\Rightarrow x(x-1)(x+1) \neq 0 \Rightarrow x \neq -1, 0, 1$ $D_f = \mathbb{R} - \{-1, 0, 1\}$	(الف) $(x^3 - 4x) = x(x^2 - 4) \Rightarrow x = (0, \pm 2)$ $(x^3 - 4x) = x(x^2 - 4) \neq 0 \Rightarrow x \neq (-2, 0, 2)$  $D_f = \mathbb{R} - \{-2, 0, 2\}$
$x x > 0$ $x > 0 \Rightarrow x = x \Rightarrow x x = x^2$ $x < 0 \Rightarrow -x = x \Rightarrow -x x = -x^2$ همواره مثبت $x = \begin{cases} x^2 & \text{مثبت} \\ -x^2 & \text{منفی} \end{cases}$ $D_f = (0, +\infty)$	(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) $y = \sqrt{2 - [x]}$ $2 - [x] > 0 \Rightarrow [x] \leq 2$ $\Rightarrow x < 3$ $D_f = (-\infty, 3)$
$[a] + [-a] = 0 \text{ if } a \in \mathbb{Z}$ $[a] + [-a] = -1 \text{ if } a \notin \mathbb{Z}$ $x - \frac{1}{x} \in \mathbb{Z} \Rightarrow x = z + \frac{1}{x}$ $D_f \in \{x \mid x = z + \frac{1}{x}, z \in \mathbb{Z}\}$	(الف) $[x + \frac{1}{x}] + [x - \frac{1}{x}] > 0$ $[x + \frac{1}{x}] + [x + \frac{1}{x}] > 1$ $2[x + \frac{1}{x}] > 1 \Rightarrow [x + \frac{1}{x}] > \frac{1}{2}$
$2 \sin^2 x - 1 \neq 0 \Rightarrow 2 \sin^2 x \neq 1$ $\Rightarrow \sin^2 x \neq \frac{1}{2}$  $\Rightarrow \sin x \neq \pm \frac{1}{\sqrt{2}} \Rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2}$ $\sin x \neq \pm \frac{\sqrt{2}}{2} \mid D_f = \mathbb{R} - \{\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}\}$	(الف) $\sin x - 1 \neq 0 \Rightarrow \sin x \neq 1$ $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

$\cos x - 1 > 0 \Rightarrow \cos x > 1 \Rightarrow$ $\cos = [1, -1] \leftarrow D_f = \{2k\pi\}$ $\odot \checkmark$	الف $ \sin x - 1 > 0 \Rightarrow \sin x < 1$ $\sin x > \frac{1}{2}$ $D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$ 6
$-1 < x^2 + 3x + 1 \leq 1$ $x^2 + 3x + 1 > -1 \Rightarrow x^2 + 3x + 2 > 0 \Rightarrow (x+1)(x+2) > 0$ $x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0$ $D_f = [-3, -1] \cup [0, 1]$ $\odot \checkmark$	الف $-1 < x \leq 1$ $\Rightarrow 1 < x \leq 2$ $D_f = [-2, -1] \cup [1, 2]$ 7
$x^2 - x > 0 \Rightarrow x(x-1) > 0$ $\Rightarrow x(x-1)(x+1) > 0$ $D_f = (-\infty, 0) \cup (1, \infty)$ $\odot \checkmark$	الف $2 - \log(x^2) > 0$ $\Rightarrow \log(x^2) < 2$ $\Rightarrow x^2 < 100$ $\Rightarrow x < 10$ $D_f = (-10, 10]$ 8
$\sum_{i=1}^n x_i \neq 0 \Rightarrow \sum_{i=1}^n x_i \neq 0$ $\Rightarrow x \neq \log \frac{1}{2}$ $D_f = \mathbb{R} - \{\log \frac{1}{2}\}$	الف $\sum_{i=1}^n x_i \neq 0 \Rightarrow \sum_{i=1}^n x_i \neq 0$ $\Rightarrow x \neq 0$ $D_f = \mathbb{R} - \{0\}$ 9
$\frac{2x-2}{x-2} \in \mathbb{W} \Rightarrow \frac{2x-2}{x-2} \in \mathbb{W} - \Delta \mathbb{W}$ $\Rightarrow \frac{2x-2}{x-2} \in \mathbb{W} - \Delta \mathbb{W}$ $\Rightarrow (2-x) \in \mathbb{W} - \Delta \mathbb{W}$ $\Rightarrow x = \frac{2-\Delta \mathbb{W}}{2-x} \Rightarrow D_f = \{x \mid \frac{2-\Delta \mathbb{W}}{2-x}, k \in \mathbb{W}\}$ $\odot \checkmark$	الف $\sum_{i=1}^n x_i \in \mathbb{W}$ $\sum_{i=1}^n x_i \in \mathbb{W} - 1$ $x \in \frac{\mathbb{W}-1}{2}$ $D_f = \{x \mid x = \frac{k-1}{2}, k \in \mathbb{W}\}$ 10