

الف)

$$\sqrt{\frac{x^2 - 4x}{x^3 - x}}$$

$$x^2(x-1) \rightarrow x+1, 0$$

$$x^2 - 4x = x(x-4)$$

به دلیل نقیض شدن نام توانها خازاری غرض  
بنا صفری طواحد شد

|    |     |   |   |
|----|-----|---|---|
| -1 | * 0 | 1 | 6 |
| -  | +   | + | - |

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

(1)

ب)  $\sqrt{\frac{x^5 - x^3}{x^3 - x}} \rightarrow x^2(x^2 - 1) \rightarrow x^2(x-1)(x+1)$   
 $\rightarrow x(x^2 - 1) \rightarrow x(x-1)(x+1)$

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

الف)  $\frac{x+1}{\sqrt{x+|x|}} \rightarrow \checkmark$

$$\sqrt{x+|x|} \rightarrow x+|x| > 0$$

الف)  $\leftarrow$  صفر  $\times$

الف)  $\leftarrow$  صفر  $\checkmark$

الف)  $\oplus$  مثبت  $\checkmark$  یا  $(0, +\infty)$  یا  $R^+$  یا اعداد مثبت  $D_f$

ب)  $\frac{1}{\sqrt{x|x|}} \rightarrow \checkmark$

$$\sqrt{x|x|} \rightarrow x|x| > 0$$

الف)  $\leftarrow$  صفر  $\checkmark$

الف)  $\leftarrow$  منفی  $\times$

الف)  $\oplus$  مثبت  $\checkmark$

$D_f = R^+$

(2)

$$\text{الف) } y = \sqrt{2 - [x]} \rightarrow y \geq 0 \rightarrow [x] \leq 2 \rightarrow x \leq 3$$

$$D_f = (-\infty, 3)$$

Ⓟ ✓

$$\text{ب) } \frac{1}{\sqrt{2 - [x]}} \rightarrow > 0 \rightarrow [x] < 2 \rightarrow x < 2$$

$$D_f = (-\infty, 2)$$

$$\text{الف) } y = \sqrt{[x - \frac{1}{3}] + [x + \frac{2}{3}]} \rightarrow [x - \frac{1}{3}] + [x + \frac{2}{3}] \geq 0 \rightarrow$$

$$[x + \frac{2}{3} - 1] + [x + \frac{2}{3}] \geq 0 \rightarrow [x + \frac{2}{3}] - 1 + [x + \frac{2}{3}] \geq 0 \rightarrow$$

$$2[x + \frac{2}{3}] \geq 1 \rightarrow [x + \frac{2}{3}] \geq \frac{1}{2} \rightarrow x + \frac{2}{3} \geq 1 \rightarrow x \geq \frac{1}{3} \rightarrow$$

$$D_f = [\frac{1}{3}, +\infty)$$

1, 1/3

$$\text{ب) } y = \sqrt{[x - \frac{1}{3}] + [-x + \frac{1}{3}]} \rightarrow \sqrt{[x - \frac{1}{3}] + (-[x - \frac{1}{3}])}$$

$$x \in \mathbb{Z} \xrightarrow{C_{22}} [x] + [-x] = 0$$

$$x - \frac{1}{3} \in \mathbb{Z} \rightarrow D_f = \{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\}$$

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

$\sin x \neq 1$

$x \neq \frac{\pi}{2}, \frac{3\pi}{2}$

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



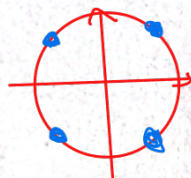
(1)

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

$D_f = \{k\pi \pm \frac{\pi}{2}\}$

$2\sin^2 x \neq 1$

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



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

(4)

$D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}\right]$

1, 5

ب)  $y = \sqrt{\cos x - 1} \geq 0 \rightarrow \cos x \geq 1 \rightarrow D_f = [2k\pi, 2k\pi + \pi]$

الف)  $\cos y = |x| - 3 \rightarrow -1 \leq |x| - 3 \leq 1 \rightarrow 2 \leq |x| \leq 4 \rightarrow D_f = [2, 4] \cup [-4, -2]$

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

ب)  $\arccos(x^2 + 3x + 1) \rightarrow x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0$   
 $x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0$

$\rightarrow (x+2)(x+1) \geq 0$

$\rightarrow x(x+3) \geq 0$

$[-3, -2] \cup [-1, 0]$

$D_f = (-\infty, -3] \cup [-1, 0] \cup [0, +\infty)$

الف)  $y = \sqrt{x-1} \log_3(x-1)$   $x-1 > 0 \rightarrow x > 1$

1

$x-1 \log_3(x-1) \geq 0 \rightarrow \log_3(x-1) \leq 1 \rightarrow x-1 \leq 9 \rightarrow x \leq 10$

$D_f = (1, 10]$

ب)  $\log_3(x^2-1) \geq 0$   $x(x-1) > 0$   $D_f = (-\infty, -1) \cup (1, \infty)$   
 $(-\infty, -1) \cup (1, \infty)$

الف)  $x^n + 1 \neq 0 \rightarrow x^n \neq -1 \rightarrow \checkmark D_f = \mathbb{R}$

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

ج)  $x^n - 2 \neq 0 \rightarrow x^n \neq 2 \rightarrow D_f = \mathbb{R} - \{\log_3 2\}$

2 ✓

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

الف)  $y = (x+1)! \rightarrow x+1 \in \mathbb{N} \rightarrow x \in \mathbb{N} - 1 \rightarrow x \in \frac{\mathbb{N}-1}{2}$

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$D_f = \{x \mid \frac{k-1}{2}, k \in \mathbb{N}\}$

1, 2, 3 ✓

ب)  $y = \left(\frac{x-1}{x+1}\right)! \rightarrow x = -\frac{-\omega k + 1}{\omega k + 1} \rightarrow D_f = \left\{x \mid -\frac{\omega k + 1}{\omega k + 1}, k \in \mathbb{N}\right\}$