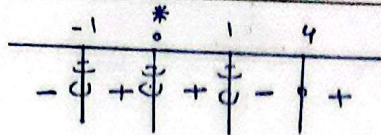


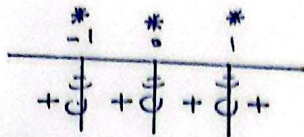
۲۰ آذرین

الف) $\frac{x(x-4)}{x(x-1)(x+1)} \geq 0$



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

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



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

الف) $x + |x| > 0$

- $\oplus \checkmark$
- $\ominus \times$
- $\odot \times$

$D_f = (0, +\infty)$

ب) $x|x| > 0$

- $\oplus \checkmark$
- $\ominus \times$
- $\odot \times$

$D_f = (0, +\infty)$

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

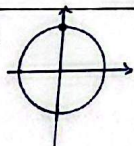
ب) $2 - [x] > 0 \rightarrow D_f = (-\infty, 2)$
 $[x] < 2$

الف) $[x - \frac{1}{\sqrt{e}}] + [x + \frac{1}{\sqrt{e}}] \geq 0 \rightarrow [x + \frac{1}{\sqrt{e}}] - 1 + [x + \frac{1}{\sqrt{e}}] \geq 0 \rightarrow 2[x + \frac{1}{\sqrt{e}}] \geq 1$
 $[x + \frac{1}{\sqrt{e}}] \geq \frac{1}{2}$ (این عبارت صحیح است) $x + \frac{1}{\sqrt{e}} \geq 1 \rightarrow x \geq 1 - \frac{1}{\sqrt{e}} \Rightarrow D_f = [1 - \frac{1}{\sqrt{e}}, +\infty)$

ب) $[x - \frac{1}{\sqrt{e}}] + [-(x - \frac{1}{\sqrt{e}})] \rightarrow x - \frac{1}{\sqrt{e}} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z} + \frac{1}{\sqrt{e}}$

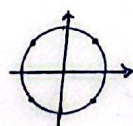
$D_f = \{x | x = k + \frac{1}{\sqrt{e}}, k \in \mathbb{Z}\}$

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



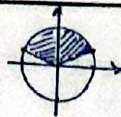
$D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

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

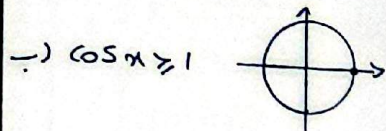


$D_f = \mathbb{R} - \{k\pi + \frac{\pi}{\sqrt{r}}, k \in \mathbb{Z}\}$

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



$$Df = [rK\pi + \frac{\pi}{4}, rK\pi + \frac{3\pi}{4}]$$



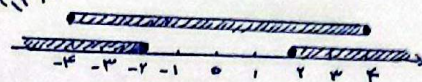
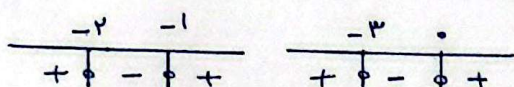
$$Df = \{rK\pi\}$$

Ⓟ ✓

$$1) -1 \leq |x| - r \leq 1 \rightarrow r \leq |x| \leq r+1$$

$$\begin{aligned} |x| \geq r &\rightarrow x \geq r \text{ or } x \leq -r \\ |x| \leq r+1 &\rightarrow -r-1 \leq x \leq r+1 \end{aligned}$$

$$Df = [-r-1, -r] \cup [r, r+1]$$



Ⓟ ✓

$$1) x^r + rx + 1 \geq -1 \rightarrow x^r + rx + r \geq 0 \rightarrow (x+1)(x+r) \geq 0 \rightarrow (-\infty, -r] \cup [-1, +\infty)$$

$$x^r + rx + 1 \leq 1 \rightarrow x^r + rx \leq 0 \rightarrow x(x+r) \leq 0 \rightarrow [-r, 0] \quad Df = [-r, -r] \cup [-1, 0]$$

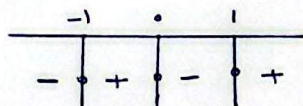
$$1) x - r > 0 \rightarrow x > r$$

$$r - \log_{\frac{1}{r}}(x-r) \geq 0 \rightarrow \log_{\frac{1}{r}}(x-r) \leq r \rightarrow x-r \leq r^r \rightarrow x \leq r^r + r$$

$$Df = (r, r^r + r]$$

Ⓟ ✓

$$1) x^3 - x > 0 \rightarrow x(x-1)(x+1) > 0$$



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

$$1) Df = \mathbb{R} \quad 1) r^x \neq 1 \rightarrow x \neq 0 \quad Df = \mathbb{R} - \{0\}$$

$$2) r^x \neq r \rightarrow r^{rx} \neq r^1 \quad Df = \mathbb{R} - \{\frac{1}{r}\}$$

$$3) r^x \neq r \rightarrow \log_r r^x \neq x \quad Df = \mathbb{R} - \{\log_r r\}$$

Ⓟ ✓

$$1) rx + 1 \in \mathbb{W} \rightarrow x \in \frac{\mathbb{W} - 1}{r} \quad Df = \{x | x \in \frac{K-1}{r}, K \in \mathbb{W}\}$$

$$1) \frac{rx - r}{rx - r} \in \mathbb{W} \rightarrow x \in -\frac{-\mathbb{W} + r}{rx - r} \quad Df = \{x | x \in \frac{\mathbb{W}K - r}{rx - r}, K \in \mathbb{W}\}$$

$$= \frac{\mathbb{W} - r}{rx - r}$$

Ⓟ ✓