

تکلیف شماره ۳:

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$$y = \frac{x+2}{2x^3+2x^2-1x+2} \rightarrow \text{به ضرایب تقسیم} \rightarrow \sqrt{x-1}$$

-1

$$\begin{array}{r} 2x^3 + 2x^2 - 1x + 2 \\ \underline{2x^3 - 2x^2} \\ 4x^2 - 1x + 2 \\ \underline{4x^2 - 8x} \\ 7x + 2 \end{array} \quad \begin{array}{r} x-1 \\ \underline{2x^2+4x-2} \\ 2x^2+8x-4=0 \\ (x-1)(x+4)=0 \\ \frac{-1}{2} \quad \frac{-4}{2} = -2 \end{array}$$

$$Df = R_1 - \left\{ 1, \frac{1}{2}, -2 \right\}$$

$$y = \frac{x+2}{2x^3+4x^2+10x+2} \rightarrow \text{به ضرایب تقسیم} \rightarrow \sqrt{x+1}$$

$$\begin{array}{r} 2x^3 + 4x^2 + 10x + 2 \\ \underline{2x^3 + 2x^2} \\ 2x^2 + 10x + 2 \\ \underline{2x^2 + 4x} \\ 6x + 2 \\ \underline{6x + 6} \\ -4 \end{array} \quad \begin{array}{r} x+1 \\ \underline{2x^2+4x+2} \\ 2x^2+6x+4 \\ (x+1)(x+2)=0 \\ \frac{-1}{2} \quad \frac{-2}{2} = -1 \end{array}$$

$$Df = R_1 - \left\{ -1, \frac{1}{2}, -2 \right\}$$

$$1) \frac{x+1}{x^2-2x+1} \rightarrow \frac{x+1}{(x-1)^2} \rightarrow x-1 \checkmark$$

-r

$$x^2 - 2x + 1 \mid x+1 \rightarrow x^2 - 2x + 1 \sim b^2 - 2ac = 1 - 2 < 0 \rightarrow x^2$$

$$\frac{-x^2 + 2x}{-x^2 + x} \quad x-1$$

$$D_f = R_1 - \{1\}$$

$$2) \frac{x+1}{x^2-2x+1} \geq 0 \quad \begin{array}{c|c|c} -1 & 1 & \\ \hline + & - & + \\ \hline 0 & 2 & \end{array} \quad D_f = R_1 - (-1, 1]$$

$$y = \frac{r}{x^2 - 2|x-1| - 2x + 2}$$

-r

$$x > 1 \rightarrow x^2 - 2x + 2 - 2x + 2 = x^2 - 4x + 4 = (x-2)^2 \geq 0$$

$$x < 1 \rightarrow x^2 - 2 + 2x - 2x + 2 = x^2 \geq 0$$

$$D_f \subseteq R_1 - \{2, 0, -2\}$$

$$3) [-x] - 2 \geq 0 \rightarrow [-x] \geq 2$$

-r

$$-x \geq 2 \rightarrow x \leq -2$$

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

$$4) [x]^2 - 2[x] - 3 \neq 0$$

$$([x]-3)([x]+1) \rightarrow [x] \neq 3 \quad [x] \neq -1$$

$$x \notin [3, 4) \quad x \notin [-1, 0)$$

$$D_f = R_1 - [3, 4) \cup [-1, 0)$$

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$$vi) \left[x - \frac{1}{r} \right] + \left[x + \frac{r}{2} \right] \geq 0$$

$$\left[x - \frac{1}{r} \right] + \left[x + \frac{r}{2} - 1 + 1 \right] \geq 0$$

$$\left[x - \frac{1}{r} \right] + \left[x - \frac{1}{r} \right] + 1 \geq 0$$

$$2 \left[x - \frac{1}{r} \right] \geq -1 \rightarrow \left[x - \frac{1}{r} \right] \geq -\frac{1}{2}$$

$$\left[x - \frac{1}{r} \right] \geq 0$$

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

$$vii) \left[x - \frac{1}{r} \right] + \left[\frac{1}{r} - x \right] \geq 0 \quad D_f = \{x \mid x \in \mathbb{Z}\}$$

$$viii) \frac{\cot x + 1}{\tan x + 1} \rightarrow \frac{\cos}{\sin} \rightarrow \sin x \neq 0 \rightarrow x \neq k\pi$$

$$\frac{\tan x + 1}{\cos} \rightarrow \cos x \neq 0 \quad \tan x + 1 \neq 0$$

$$x \neq k\pi + \frac{\pi}{2} \quad \tan x \neq -1$$

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

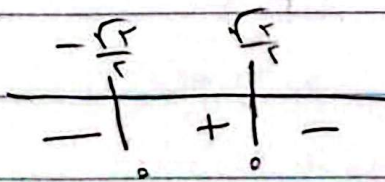
$$ix) 1 - r \sin^2 x \geq 0$$

$$(1 - r \sin^2 x) (1 + r \sin^2 x) \geq 0$$

$$1 - r \sin^2 x \geq 0 \rightarrow (1 - r \sin^2 x) (1 + r \sin^2 x) \geq 0$$

$$r \sin^2 x = 1 \quad \sin x = \pm \frac{1}{\sqrt{r}}$$

$$1 - r \sin^2 x = -1 \quad \sin x = \pm \frac{1}{\sqrt{r}}$$



$$-\frac{1}{\sqrt{r}} \leq \sin x \leq \frac{1}{\sqrt{r}}$$



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

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



$D_f = [r\pi - \frac{\pi}{2}, r\pi + \frac{\pi}{2}]$ - ✓

ب) $1 - r \cos x \geq 0$
 $\cos x \leq \frac{1}{r}$



$D_f = R - (r\pi - \frac{\pi}{r}, r\pi + \frac{\pi}{r})$

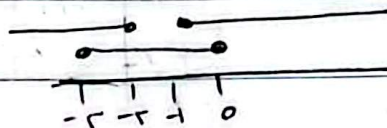
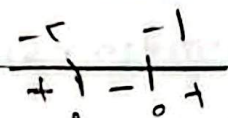
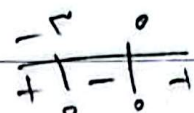
ا) $-1 \leq x^r + rx + 1 \leq 1$

$-r \leq x^r + rx \leq 0$

$x^r + rx + r \geq 0$

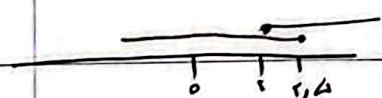
$(x+1)(x+r) \geq 0$

$x(x+r)$



$D_f = [-r, -r] \cup [-1, 0]$

ب) $-1 \leq \sqrt{a-x} \leq 1$



$a - rx \leq 1$
 $rx \geq a - 1$
 $x \geq \frac{a-1}{r}$

$a - rx \geq 0$

$x \leq \frac{a}{r}$

$x \leq \frac{a}{r}$

$x \leq \frac{a}{r}$

$D_f = [\frac{a-1}{r}, \frac{a}{r}]$

ا) $1 - \log_r x \geq 0 \rightarrow \log_r x \leq 1 \rightarrow x \leq r$

$D_f = [0, r]$

$x > 0$

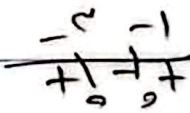
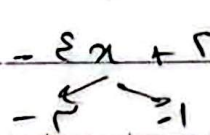
ب) $\log_r x \geq 1 \rightarrow x \leq \frac{1}{r}$ $x > 0$

$1 - \log_r x \geq 0$

$D_f = [0, \frac{1}{r}]$

ا) $r^{x-x^r} - 1 \geq 0 \rightarrow r^{x-x^r} \geq 1$

$x - x^r \geq 0 \rightarrow x^r - x + r \leq 0$



$D_f = [-r, -1]$

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$$\therefore \frac{rx + d}{rx + e} \in W \rightarrow x \in -\frac{rW + d}{rW + e}$$

$$D_f = \left\{ x \mid x = \frac{rk - d}{r - rk}, k \in W, x \neq -r \right\}$$