

الف) $y = \frac{x+3}{x^3-3x^2+3x-1}$ $\xrightarrow[\text{تقسیم بر } x-1]{\text{مجموع فریب توان برابر}} = \frac{x+3}{(x-1)(x-1)(x+1)}$ $\Rightarrow D_f = \mathbb{R} - \{1\}$

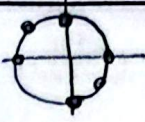
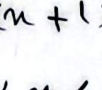
ب) $y = \frac{x+3}{x^3+9x^2+10x+3}$ $\xrightarrow[\text{بر } x+3]{\text{مجموع فریب توان برابر}} = \frac{x+3}{(x+1)(x+\frac{1}{2})(x+3)}$ $\Rightarrow D_f = \mathbb{R} - \{-3, -\frac{1}{2}\}$

الف) $y = \frac{x+3}{x^3-2x^2+2x-1}$ $\xrightarrow[\text{تقسیم بر } x-1]{\text{مجموع فریب توان برابر}} = \frac{x+3}{(x-1)(x^2-x+1)}$ $D_f = \mathbb{R} - \{1\}$
 ب) $\sqrt{\frac{x+3}{x^3-2x^2+2x-1}}$ $\xrightarrow[\text{تقسیم بر } x-1]{\text{مجموع فریب توان برابر}} = \sqrt{\frac{x+3}{(x-1)(x^2-x+1)}}$ $\Rightarrow \frac{-3}{+1-1+}$
 $D_f = (-\infty, -3] \cup (1, +\infty)$

$\frac{2}{x^2-\omega|x+1|-2x+\omega} \rightarrow x^2-\omega|x+1|-2x+\omega \neq 0$
 $x_1: x^2-\omega x+\omega+2x+\omega \neq 0 \Rightarrow x^2-7x+1 \neq 0 \quad (x-1)(6x-1)$
 $x_2: x^2+\omega x-\omega-2x+\omega \rightarrow x^2+3x=0 \rightarrow x(x+3) \neq 0$
 $D_f = \mathbb{R} - \{2, \omega, 0, -3\}$

الف) $y = \sqrt{[x]-2} \Rightarrow [x] \geq 2 \Rightarrow [x] \leq -2 \Rightarrow (-\infty, -2] = D_f$
 $\Rightarrow y = \frac{\omega x^2+6}{[x]^2-2[x]-3} \Rightarrow [x]^2-2[x]-3 \neq 0 \Rightarrow ([x]+1)([x]-3)$
 $[x] \in [-1, 0] \cup [3, 4]$
 $D_f = \mathbb{R} - \{[-1, 0] \cup [3, 4]\}$

الف) $y = \sqrt{[x-\frac{1}{x}]+[x+\frac{1}{x}]} \Rightarrow \sqrt{[x+\frac{1}{x}]+[x+\frac{1}{x}]-1} \Rightarrow 2[x+\frac{1}{x}] \geq 1 \Rightarrow [x+\frac{1}{x}] \geq \frac{1}{2}$
 $x+\frac{1}{x} \geq 1 \Rightarrow x \geq \frac{1}{x} \Rightarrow [\frac{1}{x}, +\infty) = D_f$
 ب) $\sqrt{[x-\frac{1}{x}]+[\frac{1}{x}-x]} \rightarrow \sqrt{[2x]+[x]-\frac{1}{x}-\frac{1}{x}} \rightarrow [x]+[x] \geq 0$
 $D_f = x + \frac{1}{x}, x \in \mathbb{Z}$

$\sin \neq 0$ ا) $\frac{\cot x + 1}{\tan x + 1} \rightarrow \cos x \neq 0$ $\tan x \neq -1$	 $\mathbb{R} - \left\{ \frac{k\pi}{4}, k\pi - \frac{\pi}{4} \right\} = D_f$	
ب) $y = \sqrt{1 - f \sin^2 x} \rightarrow 1 \geq f \sin^2 x \rightarrow \pm \frac{1}{f} \geq \sin x$ $D_f = \left[k\pi - \frac{\pi}{4} \cup k\pi + \frac{\pi}{4} \right]$		6
الف) $y = \sqrt{2 \sin x - 1} \rightarrow \sin x \geq \frac{1}{2}$ ب) $y = \sqrt{1 - 2 \cos x} \rightarrow \frac{1}{2} \geq \cos x$	 	7
الف) $\arcsin(x^2 + 3x + 1) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1$ $-1 \leq x^2 + 3x + 1 \rightarrow 0 \leq x^2 + 3x + 2 \rightarrow 0 \leq (x+1)(x+2) \rightarrow x \geq -1, x \leq -2$ $x^2 + 3x + 1 \leq 1 \rightarrow x(x+3) \leq 0 \rightarrow -3 \leq x \leq 0$ $D_f = [-3, 0] \cup [-1, 0]$ ب) $\cos y = \sqrt{\omega - 2x} \rightarrow -1 \leq \sqrt{\omega - 2x} \leq 1 \rightarrow \omega - 2x \leq 1 \rightarrow x \geq \frac{\omega - 1}{2}$ $D_f = \left[\frac{\omega - 1}{2}, \frac{\omega}{2} \right]$		8
الف) $y = \log_r (1 - \log_r^{\frac{1}{r}})$ $\begin{cases} x > 0 \\ 1 - \log_r^{\frac{1}{r}} > 0 \end{cases} \rightarrow 1 > \log_r^{\frac{1}{r}} \rightarrow r > x \rightarrow (0, r) = D_f$ ب) $y = \log_r (1 - \log_r^{\frac{1}{r}})$ $\begin{cases} x > 0 \\ 1 - \log_r^{\frac{1}{r}} > 0 \end{cases} \rightarrow 1 > \log_r^{\frac{1}{r}} \rightarrow r^{\frac{1}{r}} > x \rightarrow (\frac{1}{r}, +\infty)$		9
الف) $\sqrt{r^x x - x^2} - 1 \rightarrow r^{x-x^2} \geq 1 \rightarrow \log_r^{r^x - x^2} \geq \log_r^{r^x}$ $\rightarrow r^x - x^2 \geq r^x \rightarrow x^2 - 2x + 1 \geq 0 \rightarrow (x-1)^2 \geq 0 \rightarrow D_f = [1, r]$ ب) $\left(\frac{rx + \omega}{rx + f} \right) \rightarrow \frac{rx + \omega}{rx + f} \in W \rightarrow \frac{-fW - \omega}{rx - f} \rightarrow \frac{-fW + \omega}{rx - f}$ $D_f = \left\{ k \in W \rightarrow \frac{-fW + \omega}{rx - f} \in W \right\}$		10