

۲. اقلین علی بنی

الف) $y = \frac{x+3}{x^3 - 2x^2 + 3x - 1}$ $\xrightarrow{\text{مجموع فرابین بدیهه}} \frac{x+3}{(x-1)(x-1)(x+3)}$ $\rightarrow D_f = \mathbb{R} - \{1\}$

ب) $y = \frac{x+3}{x^3 - 2x^2 + 3x - 1}$ $\xrightarrow{\text{مجموع فرابین بدیهه}} \frac{x+3}{(x+1)(x+\frac{1}{2})(x+3)}$ $\rightarrow D_f = \mathbb{R} - \{-1, -\frac{1}{2}\}$

الف) $y = \frac{x+3}{x^3 - 2x^2 + 2x - 1}$ $\xrightarrow{\text{تجش بدیهه}} \frac{x+3}{(x-1)(x^2 - x + 1)}$ $D_f = \mathbb{R} - \{1\}$

ب) $\sqrt{\frac{x+3}{x^3 - 2x^2 + 2x - 1}}$ $\xrightarrow{\text{تجش بدیهه}} \sqrt{\frac{x+3}{(x-1)(x^2 - x + 1)}}$ $\geq \frac{-2}{1-1+1}$

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

$\frac{2}{x^2 - \omega|x+1| - 2x + \omega} \rightarrow x^2 - \omega|x+1| - 2x + \omega \neq 0$

$x_1: x^2 - \omega x + \omega + 2x + \omega \neq 0 \rightarrow x^2 - 7x + 1 \neq 0 \quad (x-1)(6x-1)$

$x_2: x^2 + \omega x - \omega - 2x + \omega \rightarrow x^2 + 3x = 0 \rightarrow x(x+3) \neq 0$

$D_f = \mathbb{R} - \{2, \omega, -3\}$

الف) $y = \sqrt{[-x] - 2} \rightarrow [-x] \geq 2 \rightarrow [x] \leq -2 \rightarrow (-\infty, -2] = D_f$

ب) $y = \frac{\omega x^2 + 6}{[x]^2 - 2[x] - 3} \rightarrow [x]^2 - 2[x] - 3 \neq 0 \rightarrow ([x] + 1)([x] - 3)$

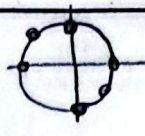
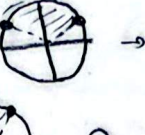
$D_f = \mathbb{R} - \{[-1, 0], [3, 4]\}$

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

$D_f = x + \frac{1}{x}, x \in \mathbb{Z}$

$\sin \neq 0$ $\Rightarrow) \frac{\cot x + 1}{\tan x + 1} \rightarrow \cos x \neq 0$ $\tan x \neq -1$ $\Rightarrow) y = \sqrt{1 - f \sin^2 x} \rightarrow 1 \geq f \sin^2 x \rightarrow \pm \frac{1}{f} \geq \sin x$ $D_f = [k\pi - \frac{\pi}{4} \cup k\pi + \frac{\pi}{4}]$	 $\mathbb{R} - \{ \frac{k\pi}{f}, k\pi - \frac{\pi}{4} \} = D_f$	
$\Rightarrow) y = \sqrt{1 - f \sin^2 x} \rightarrow 1 \geq f \sin^2 x \rightarrow \pm \frac{1}{f} \geq \sin x$ $D_f = [k\pi - \frac{\pi}{4} \cup k\pi + \frac{\pi}{4}]$		
$\Rightarrow) y = \sqrt{1 - f \sin^2 x} \rightarrow 1 \geq f \sin^2 x \rightarrow \pm \frac{1}{f} \geq \sin x$ $D_f = [k\pi - \frac{\pi}{4} \cup k\pi + \frac{\pi}{4}]$	 $D_f = [k\pi + \frac{\pi}{4} \cup k\pi + \frac{5\pi}{4}]$	
$\Rightarrow) y = \sqrt{1 - f \cos^2 x} \rightarrow \frac{1}{f} \geq \cos x$ $D_f = [k\pi + \frac{\pi}{f} \cup k\pi + \frac{5\pi}{f}]$		
$\Rightarrow) \arcsin(x^2 + 3x + 1) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1$ $-1 \leq x^2 + 3x + 1 \rightarrow 0 \leq x^2 + 3x + 2 \rightarrow 0 \leq (x+1)(x+2) \rightarrow x \geq -1, x \leq -2$ $x^2 + 3x + 1 \leq 1 \rightarrow x(x+3) \leq 0 \rightarrow -3 \leq x \leq 0$ $D_f = [-3, 0] \cup [-1, 0]$ $\Rightarrow) \cos y = \sqrt{\omega - 2x} \rightarrow -1 \leq \sqrt{\omega - 2x} \leq 1 \rightarrow \omega - 2x \leq 1 \rightarrow x \geq \frac{\omega - 1}{2}$ $D_f = [\frac{\omega - 1}{2}, \frac{\omega}{2}]$		
$\Rightarrow) y = \log_r(1 - \log_r^{\frac{1}{r}})$ $\begin{cases} x > 0 \\ 1 - \log_r^{\frac{1}{r}} > 0 \end{cases} \rightarrow 1 > \log_r^{\frac{1}{r}} \rightarrow r > x \rightarrow (0, r) = D_f$ $\Rightarrow) y = \log_r(1 - \log_r^{\frac{1}{f}})$ $\begin{cases} x > 0 \\ 1 - \log_r^{\frac{1}{f}} > 0 \end{cases} \rightarrow 1 > \log_r^{\frac{1}{f}} \rightarrow r^{\frac{1}{f}} > x \rightarrow (0, \frac{1}{f} + 1) = D_f$		
$\Rightarrow) \sqrt{r^f x - x^2} - 1 \rightarrow r^f x - x^2 \geq 1 \rightarrow \log_r^f x - x^2 \geq \log_r^f r$ $\rightarrow f x - x^2 \geq 1 \rightarrow x^2 - f x + 1 \rightarrow 0 \rightarrow \frac{(f-1)(f-1)}{4} \rightarrow D_f = [1, f]$ $\Rightarrow) (\frac{r x + \omega}{r x + f}) \rightarrow \frac{r x + \omega}{r x + f} \in \mathbb{W} \rightarrow \frac{-f \omega - \omega}{r \omega - f} \rightarrow \frac{-f \omega + \omega}{r \omega - f}$ $D_f = \{k \in \mathbb{W} \rightarrow \frac{-f k + \omega}{r k - f} \in \mathbb{N}\}$		