

الف) $y = \frac{x+2}{2x^3+3x^2-8x+3} \Rightarrow$ مخرج نباید صفر باشد $\Rightarrow 2x^3+3x^2-8x+3 \neq 0$

$2x^3+3x^2-8x+3 \div (x-1) = (2x^2+5x-3) \Rightarrow$ ریشه ها $\frac{1}{2}$ و 3 و $1 \Rightarrow ID_F = IR - \{\frac{1}{2}, 1, 3\}$

ب) $y = \frac{x+3}{2x^3-9x^2+10x+3} \Rightarrow 2x^3-9x^2+10x+3 \neq 0$ مخرج نباید صفر باشد $\Rightarrow 2x^3-9x^2+10x+3 = (x+1)(2x^2+7x+3) \neq 0 \Rightarrow$ ریشه ها $-\frac{1}{2}$ و 1 و $3 \Rightarrow ID_F = IR - \{-\frac{1}{2}, 1, 3\}$

الف) $y = \frac{x+3}{x^3-2x^2+2x-1} \Rightarrow$ مخرج نباید صفر باشد $\Rightarrow x^3-2x^2+2x-1 \neq 0$ مخرج نباید صفر باشد $\Rightarrow x^3-2x^2+2x-1 = (x-1)(x^2-x+1) \neq 0 \Rightarrow$ ریشه ها $1 \Rightarrow ID_F = IR - \{1\}$

ب) $y = \sqrt{\frac{x+3}{x^3-2x^2+2x-1}}$ عبارت زیر رادیکال نباید منفی باشد $\Rightarrow \frac{(x+3)}{(x-1)(x^2-x+1)} \geq 0$ ریشه ها 1 و 3 و $-\frac{1}{2}$ $\Rightarrow ID_F = (-\infty, -\frac{1}{2}] \cup (1, 3) \cup (3, +\infty)$

$y = \frac{2}{x^2-5|x-1|-2x+5} \Rightarrow$ مخرج نباید صفر باشد $\Rightarrow x^2-5|x-1|-2x+5 \neq 0$

① حالت $x \geq 1 \Rightarrow |x-1| = x-1 \Rightarrow x^2-5(x-1)-2x+5 \neq 0 \Rightarrow x^2-7x+10 \neq 0 \Rightarrow (x-2)(x-5) \neq 0$

② حالت $x < 1 \Rightarrow |x-1| = -x+1 \Rightarrow x^2-5(-x+1)-2x+5 \neq 0 \Rightarrow x^2+3x \neq 0 \Rightarrow x(x+3) \neq 0$

ریشه ها 0 و 2 و 3 و $5 \Rightarrow ID_F = IR - \{0, 2, 3, 5\}$

الف) $y = \sqrt{[-x]-2} \Rightarrow [-x]-2 \geq 0 \Rightarrow [-x] \geq 2 \Rightarrow x \leq -2 \Rightarrow ID_F = (-\infty, -2]$

ب) $y = \frac{5x^2+6}{[x]^2-2[x]-3} \Rightarrow [x]=t \Rightarrow t^2-2t-3 \neq 0 \Rightarrow (t-3)(t+1) \neq 0 \Rightarrow$ ریشه ها 3 و -1

$t \neq -1 \Rightarrow [x] \neq -1 \Rightarrow x \notin [-1, 0)$
 $t \neq 3 \Rightarrow [x] \neq 3 \Rightarrow x \notin [3, 4)$
 $\Rightarrow ID_F = (-\infty, -1) \cup [0, 3) \cup [4, +\infty)$

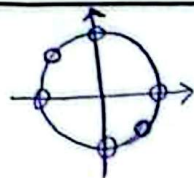
الف) $y = \sqrt{[x-\frac{1}{3}]+[x+\frac{2}{3}]} \Rightarrow [x-\frac{1}{3}]+[x+\frac{2}{3}]+1 \geq 1 \Rightarrow [x-\frac{1}{3}+1]+[x+\frac{2}{3}] \geq 1 \Rightarrow$

$2[x+\frac{2}{3}] \geq 1 \Rightarrow [x+\frac{2}{3}] \geq \frac{1}{2} \Rightarrow x+\frac{2}{3} \geq 1 \Rightarrow x \geq 1-\frac{2}{3} \Rightarrow x \geq \frac{1}{3} \Rightarrow ID_F = [\frac{1}{3}, +\infty)$

ب) $y = \sqrt{[x-\frac{1}{3}]+[\frac{1}{3}-x]} \Rightarrow [x-\frac{1}{3}]+[-(x-\frac{1}{3})] \geq 0$ عبارت زیر رادیکال باید بزرگتر یا مساوی صفر باشد

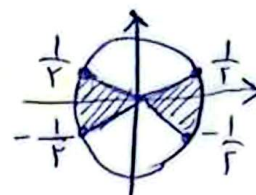
$[a]+[-a]=0$ اگر $a \in \mathbb{Z}$ $\Rightarrow [a]+[-a]=0$
 $[a]+[-a]=-1$ اگر $a \notin \mathbb{Z}$ $\Rightarrow x-\frac{1}{3} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z}+\frac{1}{3} \Rightarrow ID_F = \{x | x = k+\frac{1}{3}, k \in \mathbb{Z}\}$

الف) $y = \frac{\cot x + 1}{\tan x + 1}$
 $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$

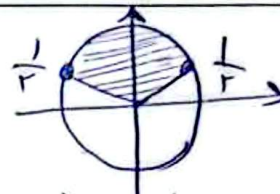


$$ID_f = \mathbb{R} - \left\{ \frac{K\pi}{4}, K\pi - \frac{\pi}{4} \right\}$$

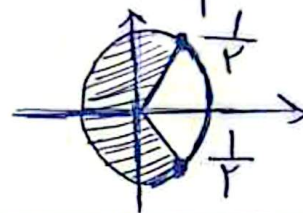
ب) $y = \sqrt{1 - r \sin^2 x} \Rightarrow r \sin^2 x \leq 1 \Rightarrow \sin^2 x \leq \frac{1}{r} \Rightarrow$
 $\frac{1}{r} \leq \sin^2 x \leq \frac{1}{r} \Rightarrow ID_f = \left[K\pi - \frac{\pi}{4}, K\pi + \frac{\pi}{4} \right]$



الف) $y = \sqrt{r \sin^2 x - 1} \Rightarrow r \sin^2 x \geq 1 \Rightarrow \sin^2 x \geq \frac{1}{r}$
 $ID_f = \left[2K\pi + \frac{\pi}{4}, 2K\pi + \frac{5\pi}{4} \right]$



ب) $y = \sqrt{1 - r \cos^2 x} \Rightarrow 1 - r \cos^2 x \geq 0 \Rightarrow \cos^2 x \leq \frac{1}{r}$
 $ID_f = \left[2K\pi + \frac{\pi}{4}, 2K\pi + \frac{5\pi}{4} \right]$



الف) $y = \arcsin(x^2 + 3x + 1) \Rightarrow x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0$
 $x^2 + 3x + 1 \geq -1 \Rightarrow x^2 + 3x + 2 \geq 0 \Rightarrow (x+1)(x+2) \geq 0$
 $I) -3 \leq x \leq 0$
 $II) x \leq -2 \text{ or } x \geq -1$
 $I \cap II \Rightarrow ID_f = [-3, -2] \cup [-1, 0]$

ب) $\cos y = \sqrt{\omega - 2x} \Rightarrow 0 \leq \omega - 2x \leq 1 \Rightarrow$
 $I) \omega - 2x \geq 0 \Rightarrow x \leq \frac{\omega}{2}$
 $II) \omega - 2x \leq 1 \Rightarrow -2x \leq 1 - \omega \Rightarrow x \geq \frac{\omega - 1}{2}$
 $\Rightarrow ID_f = \left[\frac{\omega - 1}{2}, \frac{\omega}{2} \right]$

الف) $\log_r(1 - \log_r x)$
 $I) x > 0$
 $II) 1 - \log_r x > 0 \Rightarrow 1 > \log_r x \Rightarrow x < (r)^1$
 $ID_f = [0, r]$

ب) $y = \log_r(1 - \log_r \frac{x}{r})$
 $I) x > 0$
 $II) 1 - \log_r \frac{x}{r} > 0 \Rightarrow \log_r \frac{x}{r} < 1 \Rightarrow x < (r)^1$
 $ID_f = \left(\frac{1}{r}, +\infty \right)$

الف) $y = \sqrt{r^x - x^r} \Rightarrow r^x - x^r \geq 0 \Rightarrow r^x \geq x^r \Rightarrow r^{\frac{x}{r}} \geq x \Rightarrow -x^{\frac{1}{r}} + x^{\frac{1}{r}} \geq 0$
 $\Rightarrow ID_f = [1, r]$

ب) $y = \left(\frac{rx + \omega}{rx + K} \right)!$
 $\frac{ay + b}{cy + d} = y \Rightarrow x = -\frac{dy - b}{cy - a}$
 $\frac{rx + \omega}{rx + K} \in W \Rightarrow x \in -\frac{rW - \omega}{rW - r} \Rightarrow x \in \frac{rW - \omega}{r - rW}$
 $\Rightarrow ID_f = \left\{ x \mid x = \frac{rK - \omega}{r - rK}, K \in W \right\}$