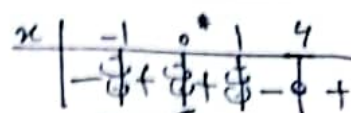
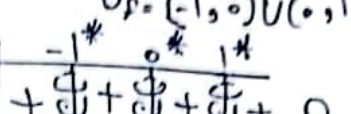


مسئله آشنایی

الف)  $y = \sqrt{\frac{x^2 - 4x}{x^2 - x}} \rightarrow y = \sqrt{\frac{x(x-4)}{x(x-1)}}$    $D_f = (-1, 0) \cup (0, 1) \cup (4, +\infty)$

ب)  $y = \sqrt{\frac{x^3 - x^2}{x^3 - x}} \rightarrow y = \sqrt{\frac{x^2(x-1)}{x(x-1)(x+1)}}$    $D_f = \mathbb{R} - \{0, \pm 1\}$

الف)  $y = \frac{x+1}{\sqrt{x+|x|}} \rightarrow x+|x| > 0 \rightarrow x > -|x| \rightarrow D_f = (0, +\infty) \subseteq \mathbb{R}^+$

ب)  $y = \frac{1}{\sqrt{x|x|}} \rightarrow x|x| > 0 \rightarrow D_f = (0, +\infty) \subseteq \mathbb{R}^+$

الف)  $y = \sqrt{2 - [x]} \rightarrow 2 - [x] \geq 0 \rightarrow [x] \leq 2 \rightarrow D_f = (-\infty, 3)$

ب)  $y = \frac{1}{\sqrt{2 - [x]}} \rightarrow 2 - [x] > 0 \rightarrow [x] < 2 \rightarrow D_f = (-\infty, 2)$

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

ب)  $y = \sqrt{[x - \frac{1}{p}] + [-x + \frac{1}{p}]} \rightarrow x - \frac{1}{p} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{p} \rightarrow D_f = \{x | x = k + \frac{1}{p}, k \in \mathbb{Z}\}$

الف)  $y = \frac{2}{\sin x - 1} \rightarrow \sin x - 1 \neq 0 \rightarrow \sin x \neq 1 \rightarrow \odot \rightarrow D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

ب)  $y = \frac{2}{2\sin^2 x - 1} \rightarrow 2\sin^2 x - 1 \neq 0 \rightarrow 2\sin^2 x \neq 1 \rightarrow \sin^2 x \neq \frac{1}{2} \rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2}$

$D_f = \mathbb{R} - \{\frac{k\pi}{2} + \frac{\pi}{4}\}$



الف)  $y = \sqrt{r \sin x - 1} \rightarrow r \sin x - 1 \geq 0 \rightarrow r \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{r} \rightarrow$    
 $D_f = [rK\pi + \frac{\pi}{6}, rK\pi + \frac{5\pi}{6}]$

ب)  $y = \sqrt{\cos x - 1} \rightarrow \cos x - 1 \geq 0 \rightarrow \cos x \geq 1 \rightarrow$    
 $D_f = \{rK\pi\}$

الف)  $\cos y = |x| - r \rightarrow -1 \leq |x| - r \leq 1 \rightarrow r \leq |x| \leq r+1 \rightarrow$   
 $r \leq x \leq r+1$   
 $-r-1 \leq x \leq -r$   
 $D_f = [-r-1, -r] \cup [r, r+1]$

ب)  $y = \arcsin(x^2 + r) \rightarrow x^2 + r \geq -1 \rightarrow x^2 + r + 1 \geq 0 \rightarrow (x+r)(x+1) \geq 0$   
 $x^2 + r + 1 \leq 1 \rightarrow x^2 + r \leq 0 \rightarrow x(x+r) \leq 0$   
 $\xrightarrow{I \cap II} D_f = [-r, -r] \cup [-1, 0]$

الف)  $y = \sqrt{r - \log_p(x-r)} \rightarrow x-r \geq 0 \rightarrow x \geq r$   
 $r - \log_p(x-r) \geq 0 \rightarrow \log_p(x-r) \leq r \rightarrow x-r \leq p^r \rightarrow x \leq r + p^r$   
 $D_f = (r, r + p^r]$

ب)  $y = \log(x^2 - x) \rightarrow x^2 - x > 0 \rightarrow x(x-1) > 0$   
 $D_f = (-1, 0) \cup (1, +\infty)$

الف)  $y = \frac{r}{r^x + 1} \rightarrow r^x + 1 \neq 0 \rightarrow r^x \neq -1 \rightarrow$    
 $D_f = \mathbb{R}$

ب)  $y = \frac{r}{r^x - 1} \rightarrow r^x - 1 \neq 0 \rightarrow r^x \neq 1 \rightarrow D_f = \mathbb{R} - \{\log \frac{1}{r}\}$

ج)  $y = \frac{r}{r^x - r} \rightarrow r^x - r \neq 0 \rightarrow r^x \neq r \rightarrow D_f = \mathbb{R} - \{\frac{1}{r}\}$

د)  $y = \frac{r}{r^x - r^3} \rightarrow r^x - r^3 \neq 0 \rightarrow r^x \neq r^3 \rightarrow D_f = \mathbb{R} - \{\log \frac{r^3}{r}\}$

الف)  $y = (r^n + 1)! \rightarrow r^n + 1 \in \mathbb{W} \rightarrow r^n \in \mathbb{W} - 1 \rightarrow n \in \frac{\mathbb{W} - 1}{r}$   
 $\Rightarrow D_f = \{n | n = \frac{K-1}{r}, K \in \mathbb{W}\}$

ب)  $y = \left(\frac{r^n - r}{r^n - a}\right)! \rightarrow \frac{r^n - r}{r^n - a} \in \mathbb{W} \rightarrow r^n - r \in r^n \mathbb{W} - a \mathbb{W} \rightarrow r^n - r \in \mathbb{W} - a \mathbb{W}$   
 $\Rightarrow n(r - r^n) \in \mathbb{W} - a \mathbb{W} \rightarrow n \in \frac{r - a \mathbb{W}}{r - r^n} \rightarrow D_f = \{n | n = \frac{K - r}{r - r^n}, K \in \mathbb{W}\}$