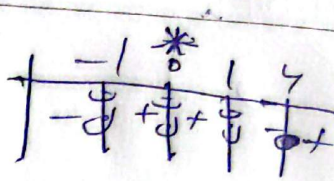


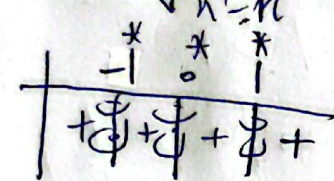
الف) $y = \sqrt{\frac{u^2 - 4u}{u^3 - u}} = \sqrt{\frac{u(u-4)}{u(u-1)(u+1)}}$



$D_f = (-1, 0) \cup (0, 1) \cup [4, +\infty)$

①

ب) $y = \sqrt{\frac{u^3 - u^2}{u^3 - 1}} = \sqrt{\frac{u^2(u-1)}{u(u-1)(u+1)}}$



$D_f = \mathbb{R} - \{-1, 0\}$

②

الف) $y = \frac{u+1}{\sqrt{u+|u|}}$

$u+|u| > 0 \rightarrow |u| > -u \Rightarrow \begin{cases} \text{اگر } u > 0 \rightarrow u > -u \checkmark \\ \text{اگر } u < 0 \rightarrow -u > -u \times \\ |u| = -u \end{cases}$

$D_f = (0, +\infty)$

ب) $y = \frac{1}{\sqrt{u|u|}} \rightarrow u|u| > 0 \rightarrow \begin{cases} \text{اگر } u < 0 \rightarrow -u^2 > 0 \times \\ \text{اگر } u > 0 \rightarrow u^2 > 0 \checkmark \end{cases}$

$\rightarrow D_f = (0, +\infty)$

③

الف) $y = \sqrt{r-x} \rightarrow r-x \geq 0$

$r \geq [x] \rightarrow D_f = (-\infty, r]$

④

ب) $y = \frac{1}{\sqrt{r-[u]}} \rightarrow r-[u] > 0 \rightarrow r > [u]$

$D_f = (r, \infty)$

(۳)

الف) $y = \sqrt{[u - \frac{1}{r}] + [u + \frac{r}{r}]} \Rightarrow [u - \frac{1}{r}] + [u + \frac{r}{r}] \geq 0$

$[u + \frac{r}{r} - 1] + [u + \frac{r}{r}] \geq 0 \rightarrow r[u + \frac{r}{r}] \geq 1$

$\rightarrow [u + \frac{r}{r}] \geq \frac{1}{r} \xrightarrow{\text{اینزیدترین عدد صحیح}} u + \frac{r}{r} \geq 1 \rightarrow \boxed{u \geq \frac{1}{r}}$

$\Rightarrow D_f = [\frac{1}{r}, +\infty)$

(۴)

ب) $y = \sqrt{[u - \frac{1}{r}] + [-u + \frac{1}{r}]} \rightarrow [u - \frac{1}{r}] + [-u + \frac{1}{r}] \geq 0$

$[u - \frac{1}{r}] + [-(u - \frac{1}{r})] \geq 0 \Rightarrow \begin{cases} u - \frac{1}{r} \in \mathbb{Z} \Rightarrow y = 0 \checkmark \\ u - \frac{1}{r} \notin \mathbb{Z} \Rightarrow y = -1 \text{ غلط} \end{cases}$

$\Rightarrow u - \frac{1}{r} \in \mathbb{Z} \Rightarrow D_f = \{u \mid u = k + \frac{1}{r}, k \in \mathbb{Z}\}$

الف) $y = \frac{r}{\sin u - 1} \quad \sin u - 1 \neq 0 \Rightarrow \sin u \neq 1$

$D_f = \{rk\pi + \frac{\pi}{p}\}$

(۵)

ب) $y = \frac{r}{r \sin^2 u - 1} \quad r \sin^2 u - 1 \neq 0 \Rightarrow r \sin^2 u \neq 1 \Rightarrow \sin^2 u \neq \frac{1}{r}$

$\Rightarrow \sin u \neq \pm \frac{1}{\sqrt{r}} \rightarrow \sin u \neq \pm \frac{\sqrt{r}}{r}$

$D_f = \{rk\pi \pm \frac{\pi}{r}, k\pi \pm \frac{\pi}{r}\}$

(۵)

الف) $y = \sqrt{2 \sin u - 1}$ $2 \sin u - 1 \geq 0$ $2 \sin u \geq 1$

$\sin u \geq \frac{1}{2}$

$D_f = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$

④

ب) $y = \sqrt{\cos u - 1}$

$\cos u - 1 \geq 0 \rightarrow \cos u \geq 1$

$D_f = 2k\pi$

⑤

الف) $\cos y = |u| - 3$

$1 \geq |u| - 3 \geq -1$

$\rightarrow -2 \leq |u| \leq 4$

⑥

$-4 \leq |u| \rightarrow -4 \leq u \leq 4$ ① و $|u| \leq 2 \rightarrow -2 \leq u \leq 2$ ②

⑦

از ①، ② $\rightarrow \begin{cases} -4 \leq u \leq -2, u \geq 2 \rightarrow -4 \leq u \leq 2 \\ -4 \leq u \leq -2, -2 \geq u \rightarrow -2 \geq u \geq -4 \end{cases}$

⑧

$D_f = [-4, -2] \cup [2, 4]$

ب) $y = \arcsin(u^2 + ru + 1)$

$1 \geq u^2 + ru + 1 \geq -1 \rightarrow \begin{cases} 1 \geq u^2 + ru + 1 \rightarrow 0 \geq u^2 + ru \\ u^2 + ru + 1 \geq -1 \rightarrow u^2 + ru + 2 \geq 0 \end{cases}$ ⑨

$\Rightarrow \begin{cases} 0 \geq u(u+r) & \begin{matrix} -r & 0 \\ + & - & + \end{matrix} & [-r, 0] \text{ ⑩} \\ (u+1)(u+r) \geq 0 & \begin{matrix} -r & -1 \\ + & - & + \end{matrix} & (-\infty, -r] \cup [-1, \infty) \text{ ⑪} \end{cases}$

$\begin{matrix} -1 & -r \\ + & - & + \end{matrix}$

از ⑩، ⑪ $\Rightarrow D_f = [-r, -1] \cup [-1, 0]$

دوم بزرگ

تکلیف شده

برای هر

الف) $y = \sqrt{r - \log_r(u-r)}$ $u-r > 0 \rightarrow u > r$ ①

$r - \log_r(u-r) \geq 0$ $r \geq \log_r(u-r) \Rightarrow r \geq u-r$ $11 \geq u-r$ ②

①، ② $\Rightarrow 11 \geq u > r$ $D_f = (r, 11]$

ب) $y = \log(u^r - u)$ $u^r - u > 0$ $u(u^{r-1} - 1) > 0$
 $u(u-1)(u+1) > 0$ $\frac{-1 \ 0 \ 1}{+ \ - \ + \ +}$ $(-1, 0) \cup (1, +\infty)$ ③

الف) $y = \frac{r}{\varepsilon^u + 1}$ $\Rightarrow D_f = \mathbb{R}$ $\varepsilon^u + 1 \neq 0$ $\varepsilon^u \neq -1$ ④

ج) $y = \frac{r}{\varepsilon^u - r}$ $\varepsilon^u - r \neq 0$ $\varepsilon^u \neq r$ $\log_\varepsilon r \neq u$ $u \neq \frac{1}{r}$
 $D_f = \mathbb{R} - \left\{ \frac{1}{r} \right\}$ ⑤

د) $y = \frac{r}{\varepsilon^u - r}$ $\varepsilon^u - r \neq 0$ $\varepsilon^u \neq r$ $\log_\varepsilon r \neq u$
 $D_f = \mathbb{R} - \left\{ \log_\varepsilon r \right\}$

الف) $y = (f_{u+1})!$ $f_{u+1} \in \mathbb{W}$ $k \in \mathbb{W} \rightarrow f_{u+1} = k$
 $f_u = k-1$ $u = \frac{k-1}{f}$ ⑥
 $D_f = \left\{ u \mid u = \frac{k-1}{f}, k \in \mathbb{W} \right\}$

ب) $\left(\frac{r_{u-r}}{r_{u-0}} \right)!$ $\frac{r_{u-r}}{r_{u-0}} \in \mathbb{W}$ $k \in \mathbb{W} \rightarrow \frac{r_{u-r}}{r_{u-0}} = r_{u-k} - \delta k$
 $r_u - r_{u-k} = -\delta k + r$ $u(r-r_k) = -\delta k + r$
 $\rightarrow u = \frac{-\delta k + r}{r-r_k}$ $D_f = \left\{ u \mid u = \frac{-\delta k + r}{r-r_k}, k \in \mathbb{W} \right\}$