

ما آفرین

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

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

✓ (۲)

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

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

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

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

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

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

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

$D_f = (-\infty, r)$

(۳)

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

(۴)

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

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

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

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

(۵)

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

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

الف) $y = \frac{r}{\sin u - 1}$

$\sin u - 1 \neq 0 \Rightarrow \sin u \neq 1$

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

(۵)

ب) $y = \frac{r}{r\sin^2 u - 1}$

$r\sin^2 u - 1 \neq 0 \Rightarrow r\sin^2 u \neq 1 \Rightarrow \sin^2 u \neq \frac{1}{r}$

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

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

(۵)

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

$D_f = [2k\pi + \frac{\pi}{r}, 2k\pi + \frac{\pi}{r}]$ (4)

ب) $y = \sqrt{\cos u - 1}$ $\cos u - 1 \geq 0 \rightarrow \cos u \geq 1$

$D_f = 2k\pi$

الف) $\cos y = |u| - r$ $1 \geq |u| - r \geq -1$

$\rightarrow f \geq |u| \geq r$

$f \geq |u| \rightarrow f \geq u \geq -f$ (1) و $|u| \geq r \rightarrow -r \leq u \leq r$ (2)

از (1), (2) $\rightarrow \begin{cases} f \geq u \geq -f, u \geq r \rightarrow f \geq u \geq r \\ f \geq u \geq -f, -r \leq u \rightarrow -r \leq u \leq -f \end{cases}$

$D_f = [f, f] \cup [-f, -r]$

ب) $y = \arcsin(u^2 + ru + 1)$

$1 \geq u^2 + ru + 1 \geq -1 \rightarrow \begin{cases} u^2 + ru + 1 \geq 1 \rightarrow u^2 + ru \geq 0 \\ u^2 + ru + 1 \geq -1 \rightarrow u^2 + ru + 2 \geq 0 \end{cases}$ (3)

$\Rightarrow \begin{cases} u \geq 0 \text{ or } u \leq -r \\ u^2 + ru + 2 \geq 0 \end{cases}$ (4)

$\rightarrow \begin{cases} (u+1)(u+r) \geq 0 \\ u^2 + ru + 2 \geq 0 \end{cases}$ (5)

$\begin{cases} u \geq 0 \\ u \leq -r \end{cases}$

از (4), (5) $\Rightarrow [-r, -1] \cup [-1, 0]$

دوم بزرگ

تکلیف شده

برای هر

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

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

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

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

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

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

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

الف) $y = (\varepsilon_{u+1})!$ $\varepsilon_{u+1} \in \mathbb{W}$ $k \in \mathbb{W} \rightarrow \varepsilon_{u+1} = k$ $\varepsilon_u = k-1$ $u = \frac{k-1}{\varepsilon}$ ⑥

$D_f = \{u \mid u = \frac{k-1}{\varepsilon}, k \in \mathbb{W}\}$ $\checkmark$

ب) $(\frac{r(u-r)}{r(u-\delta)})!$ $\frac{r(u-r)}{r(u-\delta)} \in \mathbb{W}$ $k \in \mathbb{W} \rightarrow \frac{r(u-r)}{r(u-\delta)} = k$ $\frac{r(u-r)}{r(u-\delta)} = k$

$r(u-r) = -\delta k + r$ $u(r-rk) = -\delta k + r$

$\rightarrow u = \frac{-\delta k + r}{r - rk}$

$D_f = \{u \mid u = \frac{-\delta k + r}{r - rk}, k \in \mathbb{W}\}$