

الف) $y = \sqrt{\frac{x^2 - 4x}{x^3 - x}}$ $x^2 - 4x \geq 0$ $x(x-4) \geq 0$ $x = 0$ یا $x = 4$

$x^3 - x \geq 0$ $x(x^2 - 1) \geq 0$ $x = 0$ یا $x = \pm 1$

$x = 0$ یا $x = \pm 1$ ✗

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

$- \oplus + \oplus - \oplus +$ $1, 4 \Delta \checkmark$

ب) $y = \sqrt{\frac{x^3 - x^2}{x^2 - x}}$ $x^3 - x^2 \geq 0$ $x^2(x-1) \geq 0$ $x = 0$ یا $x = 1$

$x^2 - x \geq 0$ $x(x-1) \geq 0$ $x = 0$ یا $x = 1$

$x = 0$ یا $x = 1$ ✗

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

$+ \oplus + \oplus +$

الف) $y = \frac{x+1}{\sqrt{x+|x|}}$ $x+|x| > 0$

$x+|x| > 0$

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

$+ \checkmark$

$- \times$

ب) $y = \frac{1}{\sqrt{x|x|}}$ $x|x| > 0$

$0 \times$

$+ \checkmark$

$- \times$

$D_f = (0, +\infty)$

(۲) ✓

الف) $y = \sqrt{2 - [x]}$ $2 - [x] \geq 0$ $[x] \leq 2$

$D_f = (-\infty, 3)$

ب) $y = \frac{1}{\sqrt{2 - [x]}}$ $2 - [x] > 0$ $[x] < 2$

$D_f = (-\infty, 2)$

(۲) ✓

الف) $y = \sqrt{[x - \frac{1}{e}] + [x + \frac{1}{e}]}$ $[x - \frac{1}{e}] + [x + \frac{1}{e}] \geq 0$

$[x - \frac{1}{e}] + [x + \frac{1}{e}] \geq 0$ $2[x - \frac{1}{e}] \geq -1$

$[x - \frac{1}{e}] \geq 0$ $[x + \frac{1}{e}] \geq 0$ $[x - \frac{1}{e}] \geq -\frac{1}{2}$

$x \geq \frac{1}{e}$ $x \geq -\frac{1}{e}$ $x \geq \frac{1}{e}$

$D_f = (\frac{1}{e}, +\infty)$

ب) $y = \sqrt{[x - \frac{1}{e}] + [x + \frac{1}{e}]}$

$D_f = \mathbb{R}$ ✗

$x - \frac{1}{e} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{e}$

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

الف) $y = \frac{2}{\sin x - 1}$ $\sin x \neq 1$ $x \neq \frac{\pi}{2}$

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

ب) $y = \frac{2}{\sin^2 x - 1}$ $\sin^2 x \neq 1$ $\sin^2 x \neq \frac{1}{4}$

$\sin x \neq \pm \frac{1}{2} \rightarrow k\pi \pm \frac{\pi}{6}$

$D_f = \mathbb{R} - \{k\pi + \frac{\pi}{6}, k\pi - \frac{\pi}{6}\}$



الف) $y = \sqrt{r \sin u - 1}$

$r \sin u - 1 \geq 0$
 $r \sin u \geq 1$
 $\sin u \geq \frac{1}{r}$

$2k\pi + \frac{\pi}{2} \leq u \leq 2k\pi + \frac{3\pi}{2}$

$D_f = [2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2}]$

ب) $y = \sqrt{\cos u - 1}$

$\cos u \geq 1 \rightarrow$

$\{u | u = 2k\pi, k \in \mathbb{Z}\}$

$D_f = [2k\pi, 2k\pi]$

کسینوس بیشتر از
 نمی‌تونه باشه
 فقط 1 پیدا بشه

الف) $\cos y = |u| - 3$

$-1 \leq |u| - 3 \leq 1$

$2 \leq |u| \leq 4$

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

ب) $y = \arcsin(u^2 + 2u + 1)$ $D_f = (-\infty, -1] \cup [1, +\infty)$

$-1 \leq u^2 + 2u + 1 \leq 1$

$-1 \leq u^2 + 2u + 1$

$u^2 + 2u \geq 0$

$u(u+2) \geq 0$

$u = 0, u = -2$

$u^2 + 2u + 1 \leq 1$
 $u^2 + 2u \leq 0$

$(u+1)(u+1) \leq 0$

$u = -1, u = -1$

برای اینکه

$u = -1, u = -1$

الف) $y = \sqrt{r - \log_p(u-2)}$

$u-2 \geq 0$ (I) $(I) \cup (II) =$

$u \geq 2$

$r - \log_p(u-2) \geq 0$

$\log_p(u-2) \leq r \rightarrow u-2 \leq p^r$ $u \leq p^r + 2$ (II)

$D_f = [2, p^r + 2]$

ب) $y = \log(u^2 - u)$

$u^2 - u > 0$

$u(u-1) > 0$

$u = 0, u = 1$

$u < 0$ or $u > 1$

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

الف) $y = \frac{r}{\varepsilon^u + 1}$ $D_f = \mathbb{R}$

ب) $y = \frac{r}{\varepsilon^u - 1}$ $\varepsilon^u - 1 \neq 0$ $D_f = \mathbb{R} - \{0\}$

ج) $y = \frac{r}{\varepsilon^u - 2}$ $\varepsilon^u - 2 \neq 0$ $D_f = \mathbb{R} - \{\log_2 r\}$

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

الف) $y = (zu + 1)!$

$zu + 1 \in \mathbb{N}$
 $zu \in \mathbb{N} - 1$

$D_f = \{u | u = \frac{k-1}{z}, k \in \mathbb{N}\}$

ب) $y = \left(\frac{ru - r}{ru - a}\right)!$

$u = \frac{r - a}{r - ru}$

$D_f = \{u | u = \frac{r - ak}{r - rk}, k \in \mathbb{N}\}$