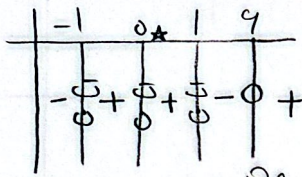
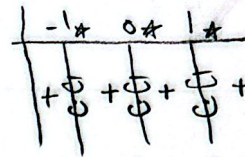


الف) $y = \sqrt{\frac{x^2 - 4x}{x^3 - x}} = \sqrt{\frac{x(x-4)}{x(x^2-1)}}$



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

ب) $y = \sqrt{\frac{x^4 - x^3}{x^3 - x}} = \sqrt{\frac{x^3(x-1)}{x(x^2-1)}}$



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

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الف) $y = \frac{x+1}{\sqrt{x+|x|}}$

$\sqrt{x+|x|} > 0 \Rightarrow \begin{cases} x = + \text{ (✓)} \\ x = - \text{ (✗)} \\ x = 0 \text{ (✗)} \end{cases}$

$D_f = (0, +\infty)$

ب) $y = \frac{1}{\sqrt{x|x|}}$

$x|x| > 0 \Rightarrow \begin{cases} x = + \text{ (✓)} \\ x = - \text{ (✗)} \\ x = 0 \text{ (✗)} \end{cases}$

$D_f = (0, +\infty)$

۲

الف) $y = \sqrt{2 - [x]}$

$2 - [x] \geq 0$

$[x] \leq 2$

$D_f = (-\infty, 3)$

ب) $y = \frac{1}{\sqrt{2 - [x]}}$

$2 - [x] > 0$

$[x] < 2$

$D_f = (-\infty, 2)$

۳

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

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

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

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

$\hookrightarrow \text{مقدار صحیح}$

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

$x - \frac{1}{x} \geq 0 \Rightarrow x \geq \frac{1}{x}$

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

$[x - \frac{1}{x}] + [-x + \frac{1}{x}] = \begin{cases} 0 \Rightarrow x - \frac{1}{x} \in \mathbb{Z} \\ -1 \Rightarrow x - \frac{1}{x} \notin \mathbb{Z} \end{cases}$

$x - \frac{1}{x} \in \mathbb{Z}$

$x \in \mathbb{Z} + \frac{1}{x}$

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

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الف) $y = \frac{r}{\sin x - 1}$

$\sin x - 1 \neq 0$

$\sin x \neq 1$

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

ب) $y = \frac{r}{r \sin^2 x - 1}$

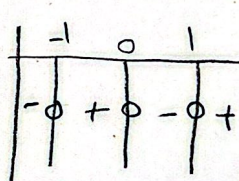
$r \sin^2 x - 1 \neq 0$

$\sin^2 x \neq \frac{1}{r}$

$\sin x \neq \pm \sqrt{\frac{1}{r}}$

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

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$\text{أ) } y = \sqrt{r \sin u - 1}$ $r \sin u - 1 \geq 0$ $\sin u \geq \frac{1}{r} \Rightarrow rK\pi + \frac{\pi}{4} \leq u \leq rK\pi + \frac{3\pi}{4}$ $D_f = \left[rK\pi + \frac{\pi}{4}, rK\pi + \frac{3\pi}{4} \right]$	$\text{ب) } y = \sqrt{\cos u - 1}$ $\cos u - 1 \geq 0$ $\cos u \geq 1 \Rightarrow rK\pi$ $D_f = \{ rK\pi \}$	6
$\text{أ) } \cos y = x - r$ $-1 \leq x - r \leq 1$ $r \leq x \leq r+1$ $\left\{ \begin{array}{l} x \leq r \Rightarrow -r \leq x \leq r \\ x \geq r \Rightarrow -r \leq x \leq r \end{array} \right.$ $D_f = [-r, r] \cup [r, r+1]$	$\text{ب) } y = \arcsin(x^r + r^r x + 1)$ $-1 \leq x^r + r^r x + 1 \leq 1$ $\left\{ \begin{array}{l} x^r + r^r x + 1 \leq 1 \Rightarrow x^r + r^r x \leq 0 \\ \Rightarrow x = [-r, 0] \\ x^r + r^r x + 1 \geq -1 \Rightarrow x^r + r^r x + r \geq 0 \\ \Rightarrow x = (-\infty, -r] \cup [-1, +\infty) \end{array} \right.$ $D_f = [-r, -r] \cup [-1, 0]$	7
$\text{أ) } y = \sqrt{r - \log_p(x-r)}$ $x-r > 0 \Rightarrow x > r$ $r < x \leq 11$ $r - \log_p(x-r) \geq 0$ $\Rightarrow \log_p(x-r) \leq r$ $x-r \leq p^r \Rightarrow x \leq 11$ $D_f = (r, 11]$	$\text{ب) } y = \log(x^3 - x)$ $x^3 - x > 0 \Rightarrow x(x-1)(x+1) > 0$  $D_f = (-1, 0) \cup (1, +\infty)$	8
$\text{أ) } y = \frac{r}{f^{u+1}}$ $f^{u+1} \neq 0$ $f^u \neq -1$ $\text{ب) } y = \frac{r}{f^u - 1}$ $f^u - 1 \neq 0 \Rightarrow f^u \neq 1 \Rightarrow u \neq 0$ $D_f = \mathbb{R} - \{0\}$	$\text{2) } y = \frac{r}{f^{u-r}}$ $f^{u-r} \neq 0 \Rightarrow f^u \neq r \Rightarrow \log_f r = u$ $\text{3) } y = \frac{r}{f^{u-r}}$ $f^{u-r} \neq r \Rightarrow \log_f r = u$ $D_f = \mathbb{R} - \{ \log_f r \}$	9
$\text{أ) } y = (f^{u+1})!$ $f^{u+1} \in \mathbb{W} \Rightarrow u \in \frac{\mathbb{W}-1}{f}$ $D_f = \left\{ u \mid u = \frac{k-1}{f}, k \in \mathbb{W} \right\}$	$\text{ب) } y = \left(\frac{r^{u-r}}{r^{u-d}} \right)!$ $\frac{r^{u-r}}{r^{u-d}} \in \mathbb{W} \Rightarrow \frac{-d+r}{r-rd}$ $D_f = \left\{ u \mid u = \frac{-dk+r}{r-rd}, k \in \mathbb{W} \right\}$	10