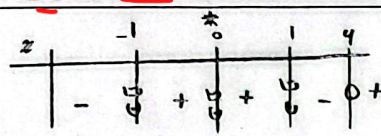
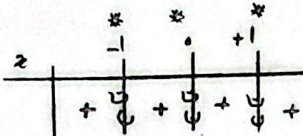


پ. آفرین

$1) \frac{x^2-4x}{x^2-x} \geq 0 \Rightarrow \frac{x(x-4)}{x(x-1)} \geq 0 \Rightarrow \frac{x-4}{x-1} \geq 0$ $2) \frac{x^2-x^2}{x^2-x} \geq 0 \Rightarrow \frac{0}{x^2-x} \geq 0 \Rightarrow 0 \geq 0$	 $D_f = (-1, 0) \cup (1, 4) \cup [4, +\infty)$	1
$1) \frac{x^2-x^2}{x^2-x} \geq 0 \Rightarrow \frac{0}{x^2-x} \geq 0 \Rightarrow 0 \geq 0$ $2) \frac{x^2-x^2}{x^2-x} \geq 0 \Rightarrow \frac{0}{x^2-x} \geq 0 \Rightarrow 0 \geq 0$	 $D_f = (-\infty, -1) \cup (-1, 0) \cup (0, 1) \cup (1, +\infty)$	2
$1) \sqrt{x+ x } > 0 \Rightarrow x+ x > 0 \Rightarrow x > - x : D_f = (0, +\infty) \cup D_f = \mathbb{R}^+$ $2) \sqrt{x x } > 0 \Rightarrow D_f = (0, +\infty) \cup D_f = \mathbb{R}^+$		3
$1) [x-\frac{1}{x}] + [x+\frac{1}{x}] \geq 0 \Rightarrow [x+\frac{1}{x}-1] + [x+\frac{1}{x}] \geq 0 \Rightarrow [x+\frac{1}{x}] - 1 + [x+\frac{1}{x}] \geq 0 \Rightarrow [x+\frac{1}{x}] \geq \frac{1}{2}$ $2) [x-\frac{1}{x}] + [-x+\frac{1}{x}] \geq 0 \Rightarrow [-\frac{1}{x}] + [-x+\frac{1}{x}] \geq 0 \Rightarrow [-\frac{1}{x}] - 1 + [-x+\frac{1}{x}] \geq 0 \Rightarrow [-\frac{1}{x}] - 1 \geq 0 \Rightarrow [-\frac{1}{x}] \geq 1 \Rightarrow \frac{1}{x} \leq -1 \Rightarrow x \leq -1$		4
$1) \sin x - 1 \neq 0 \Rightarrow \sin x \neq 1 \Rightarrow D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}\}$ $2) \sin^2 x - 1 \neq 0 \Rightarrow \sin^2 x \neq 1 \Rightarrow \sin x \neq \pm 1 \Rightarrow D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2}\}$		5

$$\frac{1}{\sqrt{r}} \times \frac{\sqrt{r}}{\sqrt{r}} = \frac{\sqrt{r}}{r}$$

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

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

$1) r \sin z - 1 \geq 0 \Rightarrow r \sin z \geq 1 \Rightarrow \sin z \geq \frac{1}{r} : D_f = \left[rk\pi + \frac{\pi}{4}, rk\pi + \frac{3\pi}{4} \right]$ $\textcircled{v} \checkmark$	6
$1) \cos z - 1 \geq 0 \Rightarrow \cos z \geq 1 \Rightarrow D_f = \{rk\pi\}$	
$1) \cos y = z - r \quad \cos y \in [-1, 1] \quad -1 \leq z - r \leq 1 \Rightarrow r \leq z \leq r+1 \Rightarrow D_f = [-r, -r] \cup [r, r]$ $\textcircled{v} \checkmark$	7
$1) y = \arcsin(z^r + rz + 1) \Rightarrow -1 \leq z^r + rz + 1 \leq 1 \Rightarrow z^r + rz + 1 \leq 1 \Rightarrow z^r + rz \leq 0 \Rightarrow z(z+r) \leq 0 \quad (1)$ $z^r + rz + 1 \geq -1 \Rightarrow z^r + rz + r \geq 0 \Rightarrow (z+r)(z+1) \geq 0 \quad (2)$	
$1) r - \log_r(z-r) \geq 0 \Rightarrow \log_r(z-r) \leq r \Rightarrow z-r \leq r \Rightarrow z \leq 11 \Rightarrow D_f = (r, 11]$ $\downarrow$ $z-r > 0 \Rightarrow z > r$ $\textcircled{v} \checkmark$	(1) $\cap$ (2)
$1) z^r - z > 0 \Rightarrow z(z^{r-1} - 1) > 0 \Rightarrow z(z-1)(z+1) > 0$ $D_f = (-1, 0) \cup (1, +\infty)$	$D_f = [-r, -r] \cup [-1, 0]$
$1) r^2 + 1 \neq 0 \Rightarrow r^2 \neq -1 \Rightarrow D_f = \mathbb{R}$ $\textcircled{v} \checkmark$	9
$1) r^2 - 1 \neq 0 \Rightarrow r^2 \neq 1$ $D_f = \mathbb{R} - \{0\}$	$1) r^2 - r \neq 0 \Rightarrow r^2 \neq r \Rightarrow D_f = \mathbb{R} - \{\log_r r\}$ $1) r^2 - r \neq 0 \Rightarrow r^2 \neq r \Rightarrow D_f = \mathbb{R} - \{\log_r r\}$
$1) (rz+1)! \Rightarrow rz+1 \in \mathbb{W} \Rightarrow rz \in \mathbb{W}-1 \Rightarrow z \in \frac{\mathbb{W}-1}{r} \Rightarrow D_f = \{z z = \frac{k-1}{r}, k \in \mathbb{W}\}$ $\textcircled{v} \checkmark$	10
$1) \left(\frac{r_z - r}{r_z - a}\right)! \Rightarrow \frac{r_z - r}{r_z - a} \in \mathbb{W} \Rightarrow r_z - r = r_{zw} - a\mathbb{W} \Rightarrow r_z - r_{zw} = r - a\mathbb{W} \Rightarrow z = \frac{r - a\mathbb{W}}{r - r_{zw}} \Rightarrow$ $D_f = \{z z = \frac{r - a\mathbb{W}}{r - r_{zw}}, k \in \mathbb{W}\}$	