

الف) $y = \sqrt{x^3 - 4x} / x^2 - x \rightarrow x^3 - 4x \geq 0 \rightarrow x(x^2 - 4) \geq 0 \rightarrow x(x-2)(x+2) \geq 0$
 $D_f = (-1, 0) \cup (0, 1) \cup [4, +\infty)$

ب) $y = \sqrt{x^3 - x^2} / x^2 - x \rightarrow x^3 - x^2 \geq 0 \rightarrow x^2(x-1) \geq 0 \rightarrow x(x-1) \geq 0$
 $D_f = \mathbb{R} - \{0, \pm 1\}$

الف) $y = x + 1 / \sqrt{x + |x|} \rightarrow x + |x| > 0 \rightarrow D_f = \mathbb{R}^+$

ب) $y = 1 / \sqrt{x|x|} \rightarrow x|x| > 0 \rightarrow D_f = \mathbb{R}^+$

الف) $y = \sqrt{2 - [x]} \rightarrow 2 - [x] \geq 0 \rightarrow [x] \leq 2 \rightarrow D_f = (-\infty, 3)$

ب) $y = 1 / \sqrt{2 - [x]} \rightarrow 2 - [x] > 0 \rightarrow [x] < 2 \rightarrow D_f = (-\infty, 2)$

الف) $y = \sqrt{[x - 1/2] + [x + 1/2]} \rightarrow [x - 1/2] + [x + 1/2] \geq 0 \rightarrow [x + 1/2] + [x + 1/2] \geq 1$
 $2[x + 1/2] \geq 1 \rightarrow [x + 1/2] \geq 1/2 \rightarrow x + 1/2 \geq 1 \rightarrow x \geq 1/2 \Rightarrow D_f = [1/2, +\infty)$

ب) $y = \sqrt{[x - 1/2] + [-x + 1/2]} \rightarrow [x - 1/2] + [-x + 1/2] \geq 0 \rightarrow x - 1/2 \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + 1/2$
 $D_f = \{x | x = k + 1/2, k \in \mathbb{Z}\}$

الف) $y = 2 / \sin x - 1 \rightarrow \sin x - 1 \neq 0 \rightarrow \sin x \neq 1 \rightarrow D_f = \mathbb{R} - \{2k\pi + \pi/2\}$

ب) $y = 2 / \sin^2 x - 1 \rightarrow 2 \sin^2 x - 1 \neq 0 \rightarrow \sin^2 x \neq 1/2 \rightarrow \sin x \neq \pm \sqrt{1/2}$
 $D_f = \mathbb{R}$

$$\text{---ii)} \quad y = \sqrt{4 \sin x - 1} \quad 4 \sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{4} \rightarrow D_f = [x | x \in [\frac{\pi}{6}, \frac{5\pi}{6}] \cup [\frac{7\pi}{6}, \frac{11\pi}{6}]]$$

$$\rightarrow y = \sqrt{\cos x - 1} \rightarrow \cos x - 1 \geq 0 \rightarrow \cos x \geq 1 \rightarrow D_f = \{ 2k\pi \pm \pi/4 \}$$

1) $\cos y = |x| - r \rightarrow -1 \leq |x| - r \leq 1 \rightarrow r \leq |x| \leq r$
 $D_f = [r, r] \cup [-r, -r]$
 2) $y = \arcsin(x^r + rx + 1) \rightarrow -1 \leq x^r + rx + 1 \leq 1$
 $x = \begin{array}{c|c|c|c|c} \hline x & -r & +1 & \\ \hline y & + & - & + \\ \hline \end{array} \Rightarrow D_f = [-r, -r]$
 $(-\infty, -r] \cup [1, \infty)$
 $x = \begin{array}{c|c|c|c|c} \hline x & -r & 0 & \\ \hline y & + & - & + \\ \hline \end{array} \Rightarrow D_f = [-r, -r]$
 $x = [-r, 0]$

$$\text{---} x) y = \sqrt{x - \log_p(x-p)} \rightarrow x - \log_p(x-p) \geq 0 \Rightarrow \log_p(x-p) \leq x \Rightarrow \log_p(x-p) \leq \log_p(x-p) \leq 1$$

$$\rightarrow x \leq 1, \quad x-p > 0 \rightarrow x > p \rightarrow D_f = (p, 1]$$

$\frac{1}{-}) y = \log(x^2 - x) \rightarrow x^2 - x > 0 \rightarrow x(x-1) > 0$

$x \neq 0, 1 \Rightarrow x < 0 \vee x > 1$

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

x	-1	0	+1
y	-	+	-

— 1) $y = r / r^{n+1} \rightarrow r^{n+1} \neq 0 \rightarrow r^n \neq -1$. $D_f = \mathbb{R} - \left\{ \log^{-1} r \right\}$

—) $y = w / r_{-1}^n \rightarrow r_{-1}^n \neq 0 \rightarrow r^n \neq 1$. $D_f = \mathbb{R} - \left\{ \log^1 r \right\}$

2.) $y = w/k_{-r} \rightarrow k_{-r} \neq 0 \rightarrow k_{-r} \neq r$. Def = $R - \left\{ \log \frac{r}{k} \right\}$

c) $y = v / r^u - v \rightarrow r^u - v \neq 0 \rightarrow r^u \neq v$. $D_f = \mathbb{R} - \left\{ \log \frac{v}{r} \right\}$

ب) $y = (x+1)!$ $\rightarrow x+1 \in W \rightarrow x \in W-1 \rightarrow x \in W-1/f$

$$D_f = \{u \mid u = k-1/r, k \in \omega\}$$

$$\rightarrow y = (r_n - r / r_n - \alpha)! \rightarrow r_n - r / r_n - \alpha \in \mathbb{N} \rightarrow r \in -\alpha \mathbb{N} + \frac{r}{r_n - \alpha}$$

$$D_f = \left\{ u \mid u = \omega^{k-r} / \omega^{-r} k, k \in W \right\}$$