

الف) $\frac{\sin x - 2}{2 \cos x + 1} \Rightarrow$

$2 \cos x + 1 \neq 0$

$2 \cos x \neq -1$

$\cos x \neq -\frac{1}{2} \rightarrow \cos x \neq \cos \frac{2\pi}{3}, \cos \frac{4\pi}{3}$

$D_f = R_1 - \left\{ 2k\pi \pm \frac{2\pi}{3} \right\}$

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ب) $\frac{\sin x + 1}{\cos x - 1} \Rightarrow$

$\cos x - 1 \neq 0$

$\cos x \neq 1$

$\cos x \neq \cos 0, \cos 2\pi$

$D_f = R_1 - \{k\pi\}$
 $1R - \{k\pi\}$



الف) $\frac{2 \sin x + 1}{\tan x + 1}$

$\tan x + 1 \neq 0$

$\tan x \neq -1$

$\cos x \neq 0 \rightarrow \frac{\sin x}{\cos x} \neq -1$



$D_f = R_1 - \left\{ k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4} \right\}$

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ب) $\frac{\cos x + 1}{\cot x - 1}$

$\cot x - 1 \neq 0$

$\cot x \neq 1$

$\sin x \neq 0 \rightarrow \frac{\cos x}{\sin x} \neq 1$



$D_f = R_1 - \left\{ k\pi, k\pi + \frac{\pi}{2} \right\}$

الف) $\sin y = x^2 - 2$

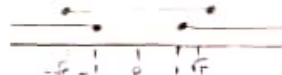
$-1 \leq x^2 - 2 \leq 1$

$1 \leq x^2 \leq 3$

$1 \leq |x| \leq \sqrt{3}$

① $|x| \leq \sqrt{3}$
 $-\sqrt{3} \leq x \leq \sqrt{3}$

② $|x| \geq 1$
 $x \geq 1 \cup x \leq -1$



$D_f = [-\sqrt{3}, -1] \cup [1, \sqrt{3}]$

ب) $\arccos(\sqrt{x} - 2)$

$-1 \leq \sqrt{x} - 2 \leq 1$

$1 \leq \sqrt{x} \leq 3$

$1 \leq x \leq 9$

$D_f = \left[\frac{1}{4}, 9 \right]$

الف) $\cos y = |x| - 2$

$-1 \leq |x| - 2 \leq 1$

$1 \leq |x| \leq 3$

$1 \leq x \leq 3 \cup -3 \leq x \leq -1$

$D_f = [-3, -1] \cup [1, 3]$

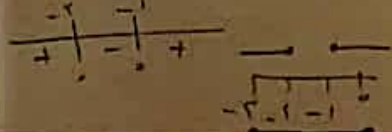
ب) $\arcsin(x^2 + 3x + 1)$

$-1 \leq x^2 + 3x + 1 \leq 1$

$0 \leq x^2 + 3x + 2 \leq 2$

$(x+1)(x+2) \leq 2$

$D_f = [-2, -1] \cup [-1, 0]$



الف) $\log_{x^2-2} x^2 - 2$

$x^2 - 2 > 0$

$x^2 > 2$

$x > \sqrt{2} \cup x < -\sqrt{2}$



$D_f = (-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty)$

ب) $\log_{x^2-1} x^2 - 1$

$x^2 - 1 > 0$

$|x| > 1$

$x > 1 \cup x < -1$

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

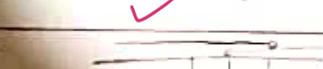
الف) $\log_{x^2-2} x^2 - 2$

① $x^2 - 2 > 0$

$x > \sqrt{2} \cup x < -\sqrt{2}$

② $x^2 - 2 > 0$

$x > \sqrt{2} \cup x < -\sqrt{2}$



$D_f = (-\infty, -\sqrt{2}) \cup (\sqrt{2}, \infty) - \{ \pm \sqrt{2} \}$

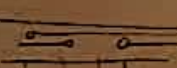
ب) $\log_{x^2-1} x^2 - 1$

① $x^2 - 1 > 0$

$x^2 > 1$

$|x| > 1$

$x > 1 \cup x < -1$



$D_f = (-\infty, -1) \cup (1, \infty) - \{ \pm 1 \}$

الف) $x + 3 > 0$

$x > -3$

② $x + 3 \neq 1$

$x \neq -2$

1) $x \in \mathbb{R} \setminus \{r\}$ ✓

б) $y = \log \frac{x+r}{x-r}$ $\left(\frac{x+r}{x-r} > 0 \right)$

1) $D = (-\infty, -r) \cup (r, +\infty) - \{r\}$ ✓

а) $y = \sqrt{x - \log_r(x)}$

$x - r > 0$
 $x > r$

Def (6.1.)

$x - \log_r(x) \geq 0$
 $\log_r(x-r) \leq r$
 $x-r \leq r^r$
 $x \leq r^r + r$

$Df = [r^r, +\infty)$

$x-r \leq r^r \rightarrow x-r \leq r$
 $x \leq r$

б) $y = \log_r(x \log_r(x) - 1)$

$x \log_r(x) - 1 > 0$
 $x \log_r(x) > 1$
 $\log_r(x) > \frac{1}{x}$
 $x > \sqrt{e}$

$x > 0$ $Df = (\sqrt{e}, +\infty)$ ✓

а) $y = \frac{x}{x+1}$

$x+1 \neq 0$ ✓

$Df = \mathbb{R}_1$

б) $\frac{x}{x-1}$

$x-1 \neq 0$
 $x \neq 1$
 $x \neq \log_e 1$

$Df = \mathbb{R}_1 - \{\log_e 1\} \subset \mathbb{R}_1 - \{0\}$

в) $\frac{x}{x-r}$

$x-r \neq 0$
 $x \neq r$
 $x \neq \log_r r$

$Df = \mathbb{R}_1 - \{\log_r r\}$

г) $\frac{x}{x-r^r}$

$x-r^r \neq 0$
 $x \neq r^r$
 $x \neq \log_r r^r$

$Df = \mathbb{R}_1 - \{\log_r r^r\}$

а) $y = (x+1)!$

$x+1 \in \mathbb{N}$
 $x \in \mathbb{N}-1$
 $x \in \frac{\mathbb{N}-1}{r}$

$Df = \{x | x = \frac{k-1}{r}, k \in \mathbb{N}\}$

б) $y = \left(\frac{rx-r}{rx-r} \right)!$

① $rx-r \neq 0$
 $rx \neq 0$
 $x \neq \frac{0}{r}$

② $\frac{rx-r}{rx-r} \in \mathbb{N}$

$x \in \frac{(-\infty, -r)}{rx-r} \rightarrow x \in \frac{\mathbb{N}+1}{rx-r}$

$D = \{x | x = \frac{rk+r}{rx-r}, k \in \mathbb{N}\} - \{r, 0\}$