

$$Df = R - \left\{ \frac{1}{r}, -r \right\}$$

$$الف) y = \frac{x+r}{rx^2+rx^2-1x+r} = \frac{x+r}{(rx^2+rx-3)(x-1)} = \frac{x+r}{(rx-1)(x+r)(x-1)}$$

$$(rx^2+rx^2-1x+r) \div (x-1) = rx^2+2x-3$$

$$ب) y = \frac{x+r}{rx^2+9x^2+1x+r} = \frac{x+r}{(rx^2+9x+3)(x+1)} = \frac{x+r}{(rx+1)(x+2)(x+1)}$$

$$(rx^2+9x^2+1x+r) \div (x+1) = rx^2+9x+1$$

$$Df = R - \left\{ -\frac{1}{r}, -r \right\}$$

$$ج) \frac{x+r}{x^2-rx^2+rx-1}$$

$$x^2-rx^2+rx-1 = (x-1)(x^2-x+1) \rightarrow \Delta < 0 \text{ minimum}$$

$$Df = R - \{1\}$$

$$د) \sqrt{\frac{x+r}{x^2-rx^2+rx-1}} = \sqrt{\frac{x+r}{(x-1)(x^2-x+1)}}$$

$$\Delta < 0$$

$$\frac{x+r}{(x-1)(x^2-x+1)} \geq 0 \rightarrow Df = (-\infty, -r] \cup (1, +\infty)$$

$$x^2 - \Delta|x-1| - rx + \Delta \begin{cases} \text{① } x-1 > 0, & x^2 + \Delta x - rx + \Delta = x^2 + rx = x(x+r) \rightarrow 0 \end{cases}$$

$$\text{② } x-1 < 0, & x^2 - \Delta x + \Delta - rx + \Delta = x^2 - rx + 1 = (x-r)(x-1) \rightarrow 0$$

$$\text{① } Df = R - \{0, r\}$$

$$\text{② } \cup \text{③} = R - \{-r, r, \Delta\}$$

$$\text{⑤ } Df = R - \{r, \Delta\}$$

$$ه) [-x] - r \geq 0 \rightarrow [-x] \geq r \rightarrow -x \geq r \rightarrow x \leq -r \Rightarrow Df = (-\infty, -r]$$

$$و) y = \frac{\Delta x^2 + 4x}{[x]^2 - r[x] - r} \Rightarrow [x] = a \Rightarrow a^2 - ra - r = (a-r)(a+1) = 0$$

$$[x]^2 - r[x] - r \begin{cases} [x]=1 \rightarrow x = [-1, 0) \\ [x]=3 \rightarrow [3, 4) \end{cases} \rightarrow R - \left\{ [-1, 0) \cup [3, 4) \right\}$$

$$ز) y = \sqrt{[x - \frac{1}{r}] + [x + \frac{r}{r}]} \Rightarrow \text{① } x + \frac{r}{r} \geq 0 \Rightarrow x \geq -\frac{r}{r}$$

$$\text{② } x - \frac{1}{r} \geq 0 \Rightarrow x \geq \frac{1}{r}$$

$$\text{③ } \cap \text{②} = \left[\frac{1}{r}, +\infty \right)$$

$$ح) y = \sqrt{[x - \frac{1}{r}] + [\frac{1}{r} - x]} = \left[x - \frac{1}{r} \right] + \left[-\left(x - \frac{1}{r} \right) \right] = 0 + \frac{1}{r} \text{ for } x \in \mathbb{Z}$$

$$Df = \left\{ x \mid x = n + \frac{1}{r}, n \in \mathbb{Z} \right\}$$

$$\text{a)} y = \frac{\cot x + 1}{\tan x + 1} = \frac{\frac{\cos x}{\sin x} + 1}{\frac{\sin x}{\cos x} + 1} \Rightarrow \cos x \neq 0, \sin x \neq 0, \tan x \neq -1$$

$$Df = R - \left\{ k\pi, k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4} \right\}$$

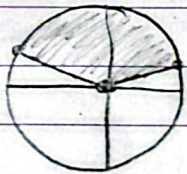


$$\text{b)} y = \sqrt{1 - f \sin^2 x} \Rightarrow 1 - f \sin^2 x \geq 0 \Rightarrow -f \sin^2 x \geq -1 \Rightarrow f \sin^2 x \leq 1$$

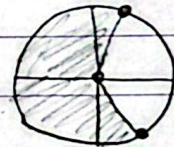
$$\Rightarrow \sin^2 x \leq \frac{1}{f} \Rightarrow -\frac{1}{\sqrt{f}} \leq \sin x \leq \frac{1}{\sqrt{f}} \Rightarrow Df = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$$



$$\text{c)} y = \sqrt{f \sin x - 1} \Rightarrow f \sin x - 1 \geq 0 \Rightarrow f \sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{f}$$



$$\Rightarrow Df = \left[k\pi + \frac{\pi}{4}, k\pi + \frac{\pi}{2} \right]$$



$$\text{d)} y = \sqrt{1 - r \cos x} \Rightarrow 1 - r \cos x \geq 0 \Rightarrow -r \cos x \geq -1 \Rightarrow r \cos x \leq 1$$

$$\cos x \leq \frac{1}{r} \Rightarrow Df = \left[k\pi + \frac{\pi}{r}, k\pi + \frac{\pi}{r} \right]$$

$$\text{e)} y = \arcsin(x^r + rx + 1) \Rightarrow -1 \leq x^r + rx + 1 \leq 1 \quad \left| \begin{array}{l} (-\infty, -r] \cup [-1, +\infty) \\ -x = -1 \\ +1 = +1 \end{array} \right.$$

$$\text{1)} x^r + rx + 1 \geq -1 \Rightarrow x^r + rx + 2 \geq 0 \Rightarrow (x+1)(x+r) \geq 0$$

$$\text{2)} x^r + rx + 1 \leq 1 \Rightarrow x^r + rx \leq 0 \Rightarrow x(x+r) \leq 0 \Rightarrow Df = (0) \cap \mathbb{R} = \left[-r, -1 \right] \cup \left[-1, 0 \right]$$

$$\text{f)} \cos y = \sqrt{a - rx} \Rightarrow 0 \leq a - rx \leq 1$$

$$\text{1)} 0 \leq a - rx \Rightarrow rx \leq a \Rightarrow x \leq \frac{a}{r}$$

$$\text{2)} a - rx \leq 1 \Rightarrow -rx \leq 1 - a \Rightarrow rx \geq a - 1 \Rightarrow x \geq \frac{a-1}{r}$$

$$\left[\frac{a-1}{r}, \frac{a}{r} \right]$$

$$\text{g)} y = \log_r(1 - \log_r x) \Rightarrow 1 - \log_r x > 0 \Rightarrow \log_r x < 1 \Rightarrow 0 < x < r$$

$$\text{h)} y = \log_r(1 - \log_r \frac{x}{r}) \Rightarrow \log_r \frac{x}{r} > 0 \Rightarrow x > r$$

$$1 - \log_r \frac{x}{r} > 0 \Rightarrow \log_r \frac{x}{r} < 1 \Rightarrow x < r^2$$

$$\text{i)} y = \sqrt{r^x - x^r - 1} \Rightarrow r^x - x^r - 1 \geq 0 \Rightarrow r^x - 1 \geq 0 \Rightarrow r^x \geq 1 \Rightarrow r^x \geq r^r$$

$$\Rightarrow x \geq r \Rightarrow r^x - x^r \geq r \Rightarrow -x^r + r^x - r \geq 0 \Rightarrow x^r - r^x + r \leq 0$$

$$\Rightarrow (x-1)(x-r) \leq 0 \Rightarrow Df = [1, r]$$

$$\text{j)} \frac{rx + a}{rx + f} \geq 0 \Rightarrow \frac{rx + a}{rx + f} \geq 0$$

$$Df = (-\infty, -r) \cup \left[-\frac{a}{f}, +\infty \right)$$

١٠ - الف) $\frac{n^2 - 1}{2} \geq 0 \rightarrow \frac{n^2 - 1}{2} \geq \frac{3}{2} \rightarrow n^2 - 1 \geq 3 \rightarrow$
 $n^2 - 2n + 3 \leq 0 \rightarrow (n-1)(n-3) \leq 0$

$$\frac{1}{+} \mid \frac{3}{-} \mid \frac{+}{+} \rightarrow D_f = [1, 3]$$