

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

$$\text{ii) } y = \frac{x+r}{rx^r + rx^r - 1x + r} = \frac{x+r}{(rx^r + rx^r - 1)(x-1)} = \frac{x+r}{(rx-1)(x+r)(x-1)}$$

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

$$\text{iii) } y = \frac{x+r}{rx^r + 9x^r + 1 \cdot x + r} = \frac{x+r}{(rx^r + 9x^r + 1)(x+1)} = \frac{x+r}{(rx+1)(x+r)(x+1)}$$

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

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

$$\text{iv) } \frac{x+r}{x^r - rx^r + rx - 1}$$

$$x^r - rx^r + rx - 1 = (x-1)(x^r - x + 1)$$

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

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

$$\Delta < 0$$

$$\frac{x+r}{(x-1)(x^r - x + 1)} \geq 0 \Rightarrow \frac{-r}{+0} = -\frac{r}{0} \Rightarrow \frac{1}{0} = +\infty$$

$$Df = (-\infty, -r] \cup (1, +\infty)$$

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

$$\text{① } Df = R - \{0, r\}$$

$$\text{② } \cup \text{③ } = R - \{-r, 0, r, \Delta\}$$

$$\text{⑤ } Df = R - \{r, \Delta\}$$

$$\text{vi) } [-x] - r \geq 0 \rightarrow [-x] \geq r \rightarrow -x \geq r \rightarrow x \leq -r \Rightarrow Df = (-\infty, -r]$$

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

$$[x]^r - r[x] - r \begin{cases} [x] = -1 \rightarrow x = [-1, 0) \\ [x] = r \rightarrow [r, r) \end{cases} \Rightarrow R - [-1, 0) \cup [r, r)$$

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

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

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

$$\text{ix) } y = \sqrt{[x - \frac{1}{r}] + [\frac{1}{r} - x]} = \left[\underbrace{x - \frac{1}{r}}_a\right] + \left[\underbrace{-(x - \frac{1}{r})}_{-a}\right] = 0 + \frac{1}{r}, x \in \mathbb{Z}$$

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

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

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

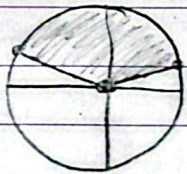


$$\text{b)} y = \sqrt{1 - f \sin^2 x} \Rightarrow 1 - f \sin^2 x \geq 0 \Rightarrow -f \sin^2 x \geq -1 \Rightarrow f \sin^2 x \leq 1$$

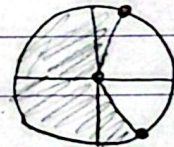
$$\Rightarrow \sin^2 x \leq \frac{1}{f} \Rightarrow -\frac{1}{\sqrt{f}} \leq \sin x \leq \frac{1}{\sqrt{f}} \Rightarrow Df = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$$



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



$$\Rightarrow Df = \left[k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4} \right]$$



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

$$\cos x \leq \frac{1}{r} \Rightarrow Df = \left[k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4} \right]$$

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

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

$$\text{2)} x^r + rx + 1 \leq 1 \Rightarrow x^r + rx \leq 0 \Rightarrow \frac{-r}{+1} \leq \frac{-r}{+1} \Rightarrow Df = \emptyset \cap \emptyset = \emptyset \cup [-1, 0]$$

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

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

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

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

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

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

$$\Rightarrow 1 - \log \frac{x}{r} > 0 \Rightarrow \log \frac{x}{r} < 1 \Rightarrow x > \frac{1}{r}$$

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

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

$$\Rightarrow (x-1)(x-r) \quad \frac{1}{+0} \quad \frac{r}{-0} \quad R = [1, r]$$

$$\text{j)} \frac{rx + \omega}{rx + f} \geq 0 \quad \frac{-r}{+0} \quad \frac{-\omega}{-0}$$

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