

الف) $\frac{x^4 - 4x}{x^3 - x} > 0$

$\frac{x(x-4)}{x(x-1)} > 0$

$\frac{0}{-} + \frac{1}{-} + \frac{4}{+}$
 $D = (-\infty, 0) \cup (0, 1) \cup [4, +\infty)$

ب) $\frac{x^3 - x}{x^3 - x} \rightarrow \frac{x^3(x^2 - 1)}{x^3(x^2 - 1)} > 0$
 $x \neq 0, 1, -1$

$D = \mathbb{R} - \{0, -1, 1\}$

الف) $\frac{x+1}{\sqrt{x+1}}$

$x+1 > 0$ $-x \leq 1$ $x < 0$
 $x+1 = x - x = 0$
 $x > 0$
 $x+1 = 2x > 0$
 $D = (0, +\infty)$

ب) $\frac{1}{\sqrt{x+1}} = \frac{1}{\sqrt{x+1}}$ $x+1 > 0$ $x \neq 0$

$D_f = (0, +\infty)$

الف) $\sqrt{2-x} > 0$

$x > [2] \rightarrow \boxed{x < 2}$ $D = (-\infty, 2)$

ب) $\frac{1}{\sqrt{2-x}}$

$2-x > 0$ $x > [2] \rightarrow x < 2$ $D = (-\infty, 2)$

الف) $\sqrt{[x+\frac{1}{p}] + [x+\frac{1}{p}]} \geq 0$

$1 + [x - \frac{1}{p}] = [x + \frac{1}{p}]$ $[b+1] - [t] + 1$

$x - \frac{1}{p} \geq 0$ $[x - \frac{1}{p}] \geq 0$ $x - \frac{1}{p} \geq 0$ $D = [\frac{1}{p}, +\infty)$

ب) $\sqrt{[x - \frac{1}{p}] + [-x + \frac{1}{p}]} \geq 0$ $b = x - \frac{1}{p}$

$b + [-t]$ $D = \{ \frac{1}{p} + x \mid x \in \mathbb{Z} \}$
 $x - \frac{1}{p} \in \mathbb{Z}$

الف) $\frac{y}{\sin x - 1}$

$\sin x - 1 \neq 0$ $\sin x \neq 1$
 $x = \frac{\pi}{2} + 2k\pi$

$D = \mathbb{R} - \{ \frac{\pi}{2} + 2k\pi \mid k \in \mathbb{Z} \}$

ب) $\frac{y}{y \sin^2 x - 1}$

$y \sin^2 x - 1 \neq 0$ $y \sin^2 x \neq 1$
 $D = \mathbb{R} - \{ \frac{\pi}{2} + \frac{k\pi}{2} \mid k \in \mathbb{Z} \}$

$\sin x \neq \pm \frac{1}{y}$
 $\sin x \neq \pm \frac{1}{y}$ $x = \frac{\pi}{2} + \frac{k\pi}{2}$

$$\rightarrow) \sqrt{\sin x - 1} > 0$$

$$\sqrt{\sin x} \geq 1$$

$$\sin x \geq \frac{1}{4}$$

$$x \geq \frac{\pi}{6} + \frac{2k\pi}{4}$$

$$\frac{\pi}{4} \leq x \leq \frac{5\pi}{4}$$

$$D = \left[\frac{\pi}{4} + 2k\pi, \frac{5\pi}{4} + 2k\pi \right]$$

$$\rightarrow) \sqrt{\cos x - 1} > 0$$

$$\cos x \geq 0$$

$$D = \left[-\frac{\pi}{2} + 2k\pi, \frac{\pi}{2} + 2k\pi \right] \quad k \in \mathbb{Z}$$

$$\rightarrow) \cos y = |x| - 1$$

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

$$D = [-2, -1] \cup [1, 2]$$

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

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

$$x(x+1) \leq 0$$

$$-2 \leq x \leq 2$$

$$D = [-2, -1] \cup [1, 2]$$

$$\rightarrow) \arcsin(x^2 + x + 1)$$

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

$$x^2 + x + 1 \geq -1$$

$$x^2 + x + 2 \geq 0$$

$$(x+1)(x+2) \geq 0$$

$$x \leq -2 \text{ or } x \geq -1$$

$$y = \sqrt{x - \log_p(x-p)}$$

$$x-p > 0$$

$$x > p$$

$$x - \log_p(x-p) > 0$$

$$\log_p(x-p) \leq x$$

$$x-p \leq p^x$$

$$x-p \leq 9$$

$$x \leq 11$$

$$D = (p, 11]$$

$$\rightarrow) y = \log(x^w - x)$$

$$x^w - x > 0$$

$$x(x^{w-1} - 1) > 0$$

$$x(x-1)(x+1) > 0$$

$$-1 < 0 < 1$$

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

$$\rightarrow) \frac{x}{f(x)}$$

$$f(x) \neq 0$$

$$f(x) \neq -1$$

$$D = \mathbb{R}$$

$$\rightarrow) \frac{x}{f(x)}$$

$$f(x) - 1 \neq 0$$

$$f(x) \neq 1$$

$$x \neq 0 \Rightarrow D = \mathbb{R} - \{0\}$$

$$\rightarrow) \frac{x}{f(x) - 1}$$

$$f(x) - 1 \neq 0$$

$$f(x) \neq 1$$

$$x = \log f^x = \frac{1}{x} \quad D = \left[\frac{1}{x}, \frac{1}{x} \right]$$

$$\rightarrow) \frac{x}{f(x) - 1}$$

$$f(x) - 1 \neq 0$$

$$f(x) \neq 1$$

$$x = \log f^x$$

$$f(x) = x-1$$

$$D = \mathbb{R} - \{\log f^x\}$$

$$D = \left\{ \frac{x-1}{x} \mid x \neq 0 \right\}$$

$$\rightarrow) \frac{(x+1)!}{x!}$$

$$x \in \{0, 1, 2, \dots\}$$

$$f(x+1) = x$$

$$D = \left\{ \frac{x}{x-1}, \frac{x}{x-2}, \frac{x}{x-3}, \dots \right\}$$

$$D = \left\{ \frac{x}{x-1} \mid x \in \mathbb{N} \right\}$$

$$\rightarrow) \left(\frac{x-x}{x-x} \right)! > 0$$

$$\frac{x-x}{x-x} = 0$$

$$x = 0, 1, 2, \dots$$

$$x-x = x(x-x)$$

$$x-x = x(x-x)$$

$$x(x-x) = x-x$$

$$x = \frac{x-x}{x-x}$$