

الف) $f(x) = \sqrt{\frac{x-1}{x} - \frac{x}{x+1}} = \sqrt{\frac{(x-1)(x+1) - x^2}{x^2 - x}} = \sqrt{\frac{x^2 + 1 - 2x - x^2}{x^2 - x}} = \sqrt{\frac{1-2x}{x^2-x}}$

$\frac{1-2x}{x^2-x} \geq 0$

$D_f = (\infty, 0) \cup [\frac{1}{2}, 1)$

ب) $f(x) = \frac{1}{x-1} - \frac{x}{x}$

$D_f = \mathbb{R} - \left\{ -\frac{1}{2}, \frac{0}{0}, 0, 1 \right\}$

الف) $f(x) = \left[\left(\frac{1}{x} \right)^x - 9 \right] (x^2 - 1)$

$\left(\left(\frac{1}{x} \right)^x - 9 \right) (x^2 - 1) \geq 0$

$D_f = (-\infty, 1) \cup \left(\frac{1}{9}, +\infty \right)$

$D_f = [1, 12]$

$\sqrt{x-1} + \sqrt{y+1} = 12$

$f(x) = \frac{\log_e(x^2 - x - 2)}{\sqrt{x^2 - 1} + 1}$

$D_f = (-\infty, -1) \cup (2, +\infty)$

$f(x) = \sqrt{x^2 + ax - x^2}$

$-x^2 + ax + 3 \geq 0$

$g(x) = \sqrt{f(x) - x}$

$f(x) - x \geq 0$

$f(x) \geq x$

$$f(\underbrace{\sin \frac{\pi}{\mu} + \cos^k \pi}_{\sqrt{\frac{w}{r}} + 1})$$

$$f(x) = x^y - x$$

$$x(x - y)$$

$$\cancel{x}(\sqrt{\frac{3}{2}}+1)(\sqrt{\frac{3}{2}}-1) \quad (\sqrt{\frac{3}{2}}+1)(\sqrt{\frac{3}{2}}-1) \quad \frac{3}{2} - \cancel{\sqrt{\frac{3}{2}}} + \cancel{\sqrt{\frac{3}{2}}} - \cancel{1} = \boxed{\frac{3}{2} - 1}$$

$$f(\underbrace{f(a)}) = a$$

$$f(x) = \frac{x+1}{x-1}$$

$$f\left(\frac{a+1}{a-1}\right) = a \rightarrow a \neq 1$$

$$\frac{a+1}{a-1} = 1$$

$$\frac{a+1}{a-1} = 1 \Rightarrow \frac{a+1}{a-1} + 1 = \frac{a+1+a-1}{a-1-a+1} = \frac{2a}{0} = \text{undefined}$$

$$f(g(a)) = x^c$$

$$g(x) = \sqrt{x^p - 1}$$

$$f(x) = x^r - kx$$

$$f(x) = -x^2$$

$$g(a) = r \sqrt{a^r - 1} = r$$

$$x^p - fx = -f$$

$$\begin{aligned} x^r - f x &= -f \\ x^r - \varepsilon x + f &= 0 \end{aligned} \quad \begin{aligned} (x-r)^r &= 0 \\ \boxed{x=r} \end{aligned} \quad \begin{aligned} a^r - 1 &= f \\ a^r &= 1+f \\ \boxed{a = \pm \sqrt[r]{1+f}} \end{aligned}$$

$$\begin{array}{ll} x + w = 1 & x + w = -w \\ x = 1 & x = -9 \end{array}$$

$x = 1 \quad x = -4$

$$f(x+y) = x^p - \omega x + y$$

$$(x-y)(x-y)$$

$$\underbrace{(1-\mu)}_{\pm 1} \underbrace{(1-\nu)}_{\pm 1} \times \underbrace{(-\gamma-\mu)}_{\pm 1} \underbrace{(-\gamma-\nu)}_{\pm 1} = \gamma \times \nu = 1 \Sigma \Sigma$$

$$f(\mu, \omega)$$

$$f(r \cos^2 x + a \cos x) = \tan^2 x$$

$$F \cos^2 \chi + \omega \cos \chi = \mu, \omega$$

$$\cos n(\underbrace{t \cos 2}_{\frac{1}{2}} + \omega) = W_1 \omega$$

$$\cos x = \frac{1}{v}$$

$$x = \frac{+\sqrt{7}}{2}$$

$$\tan^{-1} \frac{\pi}{\mu} = (\sqrt{\mu})^{\pi} = \boxed{\mu}$$