

الف) $\frac{x-1}{x} - \frac{x}{x-1} \geq 0$

$$\frac{(x-1)^2 - x^2}{x(x-1)} = \frac{x^2 + 1 - 2x - x^2}{x(x-1)} = \frac{-2x+1}{x-x} \geq 0$$

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

ب) $x \neq -1 \quad x \neq 0 \quad x \neq 1 \quad x \neq -2$

$$\frac{x}{x-1} + \frac{1}{x+2} \neq 0$$

$$D_f = \mathbb{R} - \left\{ -\frac{2}{3}, -2, -1, 0, 1 \right\}$$

$$\frac{x(x+2)+x-1}{(x-1)(x+2)} = \frac{x^2+3x-1}{(x-1)(x+2)} \neq 0 \quad x \neq -\frac{1}{3}$$

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

$$\left(\frac{1}{x}\right)^x \neq 9$$

$$x \neq \frac{1}{9}$$

$$x \neq \frac{1}{9}$$

$$x \neq -2$$

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

$$D_f = \mathbb{R} - (-2, \frac{1}{9})$$

$$\hookrightarrow 1) \sqrt{y+1} < y - \sqrt{x-1}$$

$$x-1 \geq 0$$

$$y \geq -1$$

$$\boxed{x \geq 1}$$

$$y - \sqrt{x-1} \geq 0$$

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

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

$$\boxed{x \leq y^2 + 1}$$

$$\boxed{D_f = [1, +\infty]}$$

$$x^2 - x - r > 0$$

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

$$\frac{-1}{+} \frac{r}{-}$$

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

$$D_f \cap \mathbb{R} = [-1, r]$$

$$\sqrt{x^2-1} + 1 \neq 0$$

$$\sqrt{x^2-1} \neq -1$$

$$x = -r$$

$$r + a(-r) - (-r)^2 - ra - 1 \geq 0$$

$$-ra < 1$$

$$a < -\frac{1}{r}$$

$$-x^2 - \frac{1}{r}x + r,$$

$$-rx^2 - x + 4 \geq 0$$

$$-x^2 - x + 17 \geq 0$$

$$-(x^2 + x - 17) \leq 0$$

$$(x-r)(x+r)$$

$$\frac{-1}{-} \frac{r}{+}$$

$$b < \frac{r}{r}$$

$$a < -\frac{1}{r}$$

$$a + b < \frac{r}{r} - \frac{1}{r} \geq 1$$

$$a < -\frac{1}{r} \quad b < \frac{r}{r} \quad c < -\frac{1}{r}$$

$$f(x) = \begin{cases} rx-r & x \geq 1 \\ rx+r & x < 1 \end{cases}$$

① $x \geq 1 \rightarrow \sqrt{rx-r-x} \geq \sqrt{rx-r} \quad rx-r \geq 0 \quad x \geq 1 \xrightarrow{*} x \geq 1$

② $x < 1 \rightarrow \sqrt{rx+r-x} \geq \sqrt{2+r} \quad rx+r \geq 0 \quad x \geq -r \xrightarrow{*} -\frac{r}{r} < x < 1$

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

$$D_g = [-r, +\infty)$$

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

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

$$-f = x^r - rx \quad x^r - rx + 1 = 0$$

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

$$r = \sqrt[r]{a^r - 1} \rightarrow a^r - 1 = r^r \quad \boxed{a = 1 \pm \sqrt[r]{a}}$$

Quin Verba

$$L(x+r) = x^r - dx + 4 \quad \textcircled{1} \quad x=1 \quad f(1) = 1 - d(1) + 4 = r$$

$$\textcircled{2} \quad x=-r \quad f(-r) = r^r - d(-r) + 4 = r$$

$$\boxed{f(1) = f(-r) = r \times r = 1 + r}$$

$$f(r \cos^r x + d \cos x) = \tan^r x \rightarrow f \cos^r x + d \cos x = \frac{r}{f}$$

$$f \cos^r x + d \cos x = \frac{r}{f} \cos \quad (r \cos x - 1) \left(r \cos x + \frac{r}{f} \right) = 0$$

$$\textcircled{1} \quad \cos x = \frac{1}{f} \checkmark \rightarrow \sin x = \pm \sqrt{1 - \frac{1}{f^2}}, \quad \cos x = \frac{1}{f} \quad \text{OK!}$$

$$\textcircled{2} \quad \cos x = -\frac{r}{f} \quad \text{OK!}$$

mit $[-1, 1]$ OK! OK!

$$\boxed{\tan^r x = r \quad \text{OK! OK!}} \\ \boxed{f(r/d)}$$

$$\frac{1}{f} \tan^r x = \frac{1}{\cos^r x} = \frac{1}{f} \tan^r x$$

$$\boxed{\tan^r x = r = f(r/d)}$$