

$$\frac{n-1}{n} - \frac{n}{n-1} \geq 0 \leadsto \frac{n-1}{n} \geq \frac{n}{n-1} \leadsto n \neq 1$$

الف)

$$\frac{1}{n+1} + \frac{1}{n-1} \geq 0 \leadsto \frac{n+1}{n+1} + \frac{n-1}{n-1} \geq 0 \leadsto n \neq 0$$

$$\frac{1}{n-1} + \frac{1}{n+2} \neq 0 \leadsto \frac{1}{n-1} \neq -\frac{1}{n+2} \leadsto n+2 \neq -n+1 \leadsto n+2 \neq 0 \leadsto n \neq -2$$

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

$$\left(\left(\frac{1}{x}\right)^n - 9\right)(x^2 - 4) \geq 0 \leadsto \left(\frac{1}{x}\right)^n - 9 = 0 \leadsto \left(\frac{1}{x}\right)^n = 9$$

$$x^{-n} = 9 \leadsto x = -2 \quad x^2 - 4 = 0 \leadsto x^2 = 4 \leadsto x = 2 \text{ or } x = -2$$

$$\frac{-2}{-2} \cdot \frac{2}{2} \leadsto D_f = (-\infty, -2] \cup \left[\frac{1}{9}, +\infty\right)$$

$x^{-1} \geq 0 \leadsto x \geq 1$
 $y \geq 1 \geq 0 \leadsto y \geq -1 \leadsto y \geq -1$

$$\log_f \frac{(x^2 - n - 2)}{x^2 - n - 2} \leadsto x^2 - n - 2 > 0 \leadsto \frac{a}{a+b} > \frac{c}{c} \leadsto -1 < 2 \leadsto \frac{-1}{+} > \frac{2}{+}$$

$$\leadsto (-\infty, -1) \cup (2, +\infty) \text{ ①}$$

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

$$x^2 - 1 \geq 0 \leadsto x^2 \geq 1 \leadsto \begin{cases} x \geq 1 \\ x \leq -1 \end{cases} \text{ ②} \quad D_f = (-\infty, -1) \cup (2, +\infty)$$

$$x - xa - 4 = 0 \leadsto -xa - 1 = 0 \leadsto -xa = 1 \leadsto a = -\frac{1}{x}$$

$$-x \times b = \frac{c}{x} \leadsto \frac{x}{-1} \leadsto -x \leadsto b = \frac{x}{x}$$

$$\leadsto a + b = \frac{x}{x} - \frac{1}{x} \leadsto \underline{\underline{1}}$$

$$f(n) - n \geq 0 \leadsto f(n) \geq n$$

$$f(-3) \rightarrow -3 \quad D_f = [-3, +\infty)$$

$$f(1) \rightarrow 1 \quad x + 3 \geq n \leadsto n + 3 \geq 0 \leadsto n \geq -3 \leadsto D_f = (-\infty, -3] \text{ ①}$$

$$\text{①} \cup \text{②} \leadsto (+\infty, -3] \quad x - 2 \geq n \leadsto x - 2 \geq 0 \leadsto x \geq 2 \leadsto D_f = (+\infty, 2] \text{ ②}$$

$$\sin \frac{\pi}{4} + \cos \frac{\pi}{4} = \sin 45^\circ + \cos 45^\circ = \frac{\sqrt{2}}{2} + 1 = \frac{1+\sqrt{2}}{2}$$

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

$$\rightarrow -0.8 = -\frac{1}{x}$$

$$f(f(n)) \rightarrow \frac{f(n)+1}{f(n)-1} \rightarrow \frac{n+1}{n-1} + 1 = \frac{n+1}{n-1} + \frac{n-1}{n-1} = \frac{2n}{n-1}$$

$$2n^2 - 5n + 1 = 0 \rightarrow \Delta = 14 - 14 = 0 \rightarrow \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{5 \pm 0}{2} \rightarrow 1$$

$$n^2 - 5n = -1 \rightarrow n^2 - 5n + 1 = 0 \rightarrow \Delta = 14 - 14 = 0 \rightarrow \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{5 \pm 0}{2} \rightarrow 1$$

$$\rightarrow n = 1 \rightarrow \sqrt{a^2 - 1} = 1 \rightarrow |a^2 - 1| = 1 \rightarrow a^2 - 1 = \pm 1$$

$$\begin{cases} a^2 = 0 \checkmark \\ a^2 = -1 \times \end{cases} \rightarrow a = \pm \sqrt{0}$$

$$n+1 = 1 \rightarrow n = 0 \rightarrow f(1) = 1 - 0 + 1 = 1$$

$$n+1 = -1 \rightarrow n = -2 \rightarrow f(-1) = 1 - 2 + 1 = 0$$

$$1 \times 0 = 0$$

$$f \cos^2 + 8 \cos = 1/8 \rightarrow \cos(f \cos + 8) = 1/8 \rightarrow \frac{1}{8} \times V = 1/8 \rightarrow$$

$$n = 45^\circ \rightarrow \tan 45^\circ \rightarrow \frac{\sin^2}{\cos^2} \rightarrow \frac{1}{1} = 1$$