

الف) 1) $f(x) = \sqrt{\frac{n-1}{n} - \frac{n}{n-1}} \rightarrow \textcircled{1} n \neq \{0, 1\}$

2) $\frac{n^2 + 1 - 2n - n^2}{n(n-1)} > 0 \rightarrow \frac{1-2n}{n(n-1)} > 0 \rightarrow \frac{1}{+} \frac{-}{-} \frac{1}{-}$
 $\rightarrow \text{Def: } (-\infty, 0) \cup \left[\frac{1}{2}, 1\right)$ (بج)

ب) 1) $f(x) = \frac{\frac{1}{n+1} - \frac{2}{n}}{\frac{2}{n+1} + \frac{1}{n+2}} \rightarrow \textcircled{1} n \neq \{-2, -1, 0, 1\}$

2) $cn + 4 + n - 1 \neq 0 \rightarrow \varepsilon n + 3 \neq 0 \rightarrow n \neq -\frac{3}{\varepsilon}$

$\rightarrow \text{Def: } \mathbb{R} - \left\{-2, -\frac{3}{\varepsilon}, -1, 0, 1\right\}$ (بج)

الف) 2) $f(x) = \sqrt{\left(\left(\frac{1}{2}\right)^n - 1\right)(2r - \varepsilon^n)} \rightarrow \frac{-r}{+} \frac{r\delta}{-}$
 $\rightarrow \text{Def: } (-\infty, -r] \cup [r, \delta + \infty)$ (بج)

ب) 1) $\sqrt{n-1} + \sqrt{y+1} = c \rightarrow n-1 > 0 \rightarrow n > 1$
 $\rightarrow c - \sqrt{n-1} = \sqrt{y+1} \rightarrow c - \sqrt{n-1} > 0 \rightarrow c > \sqrt{n-1} \rightarrow \underline{\underline{nr > n}}$ (بج)

الف) 3) $f(x) = \frac{\log^{(n^2-n-2)}}{\sqrt{n^2-1} + 1} \rightarrow \textcircled{1} n^2 - 1 > 0 \rightarrow n > 1$

2) $n^2 - n - 2 > 0 \rightarrow (n-2)(n+1) > 0 \rightarrow \begin{matrix} n < -1 \\ n > 2 \end{matrix}$
 $\rightarrow \text{Def: } (-\infty, -1) \cup (2, +\infty)$ (بج)

H) $f(n) \geq n$

$\xrightarrow{n \geq 1} \textcircled{1} c n - r \geq n \rightarrow r n \geq r \rightarrow \underline{\underline{n \geq 1}} \checkmark$

$\xrightarrow{n < 1} \textcircled{2} r n + c \geq n \rightarrow n \leq -c \rightarrow \underline{\underline{n \leq -c}} \checkmark$

$\rightarrow Df_i [-c, +\infty)$ (i)

$$\rightarrow \frac{\frac{a+1}{a-1} + 1}{\frac{a+1}{a-1} - 1} = \frac{\frac{2a}{a-1}}{\frac{2}{a-1}} = a = \alpha \rightarrow \text{مربع} \rightarrow \text{مربع}$$

$$\rightarrow \boxed{\alpha \in \mathbb{R} - \{1\}} \quad \text{منه}$$

2) $f(n, c) = (n-4)(n-8) \rightarrow f(n) = (n-4)(n-8)$
 $f(n) = f(n-4) = (-1)(-5)(-9) \dots$ NEGATIVE YES

$$10) \quad 2 \cos^2 x + 8 \cos x = 11 \rightarrow 1 \cos^2 x + 4 \cos x - 5 = 0$$

$$\rightarrow \cos^2 x + 4 \cos x - 5 = 0 \rightarrow (\cos x - 1)(\cos x + 5) = 0$$

$$\rightarrow \cos x = 1 \quad \begin{array}{l} \rightarrow \frac{x}{\pi} = \frac{1}{5} \checkmark \\ \rightarrow -1 \text{ } \checkmark \end{array} \rightarrow \tan x = \pm \sqrt{5}$$

$$\rightarrow \boxed{\tan x = \pm \sqrt{5}}$$