

۱) $f(x) = \sqrt{(a-2)x^2 + ax + b} \rightarrow a=2 \rightarrow f(x) = \sqrt{2x+b}$
 $x=3 \rightarrow \sqrt{4+b} = 0 \rightarrow b = -4$

۲) $f(x) = \sqrt{x^2 + 2x + 2 - m^2} \rightarrow x^2 + 2x + 2 - m^2 \geq 0$
 $\Delta \leq 0 \rightarrow 4 - 4(2 - m^2) \leq 0 \rightarrow m^2 - 1 \leq 0 \rightarrow m \geq -1 \text{ and } m \leq 1$
 $m^2 \leq 1 \rightarrow m \leq 1$
 $1 - (-1) = 2$

۳) $4 - x^2 \geq 0 \rightarrow -2 \leq x \leq 2$
 $[x] + [-x] \neq -1 \rightarrow x \in \mathbb{Z} \rightarrow x = \{-2, -1, 0, 1, 2\}$
 $g(x) = [x] + [-x] + 1$
 if $x \in \mathbb{Z} \rightarrow g(x) = 0 + 1 = 1$
 if $x \in \mathbb{Z}' \rightarrow g(x) = -1 + 1 = 0$

۴) الف) $\sqrt{x^3 + 3x^2} \rightarrow x^3 + 3x^2 \geq 0 \rightarrow x^2(x+3) \geq 0$
 $D_f = [-3, +\infty)$
 ب) $\sqrt{\frac{(x^2-1)(x^3-3x^2)}{x^3-1}} \rightarrow \sqrt{\frac{(x+1)(x-1)(x^2)(x-3)}{x^3-1}}$
 $D_f = (-\infty, -1] \cup \{0\} \cup [3, +\infty)$

الف) $y = \sqrt{|x-2|-3} \rightarrow |x-2|-3 \geq 0 \rightarrow |x-2| \geq 3$
 $x-2 \geq 3 \rightarrow x \geq 5$
 $x-2 \leq -3 \rightarrow x \leq -1$
 $D_f = (-\infty, -1] \cup [5, +\infty)$
 ب) $y = \sqrt{4 - |2-x|} \rightarrow 4 - |2-x| \geq 0 \rightarrow 4 \geq |2-x|$
 $-4 \leq x-2 \leq 4 \rightarrow -2 \leq x \leq 6$

[illegible]

$\therefore y = \frac{1}{\sqrt{r - |n - \alpha|} - 1} \rightarrow \sqrt{r - |n - \alpha|} \neq 1 \rightarrow r - |n - \alpha| \neq 1 \rightarrow |n - \alpha| \neq r$
 $\rightarrow r - |n - \alpha| \geq 0 \rightarrow |n - \alpha| \leq r \rightarrow r \leq n \leq r + 1 \quad n \neq r + 1$

الف) $y = \frac{\sin^2 x - 1}{\cos x} \rightarrow \cos x \neq 0$  $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}\}$

$\rightarrow y = \frac{\cos n}{r \cos n - 1} \rightarrow r \cos n - 1 \neq 0 \rightarrow r \cos n \neq 1 \rightarrow \cos n \neq \frac{1}{r}$

 $D_f = \mathbb{R} - \{r k \pi \pm \frac{\pi}{r}\}$

Sol) $y = \frac{n+r}{|r_{n+1}| - |n+r|} \rightarrow |r_{n+1}| \neq |n+r|$ $D_f = \mathbb{R} - \{-\frac{r}{r}, r\}$
 $\xrightarrow{()^r} |r_{n+1}| + |n+r| \neq n^r + 4n+9$
 $\rightarrow r_{n+1} - r_{n+1} \neq 0 \xrightarrow{()^r} n^r - r_{n+1} - r_{n+1} \neq 0 \rightarrow (n-r)(n+r) \neq 0 \rightarrow n \neq -\frac{r}{r}$
 2) $y = \sqrt{|r_{n+1}| - |n+r|} \rightarrow |r_{n+1}| - |n+r| \geq 0 \rightarrow |r_{n+1}| \geq |n+r|$
 $\xrightarrow{()^r} |r_{n+1}| + |n+r| \geq n^r + 4n+9 \rightarrow r_{n+1} - r_{n+1} \geq 0 \rightarrow \frac{-r}{r} \geq r \rightarrow D_f = (-\infty, -\frac{r}{r}] \cup$

$f(n) = \sqrt{\log \log_{\Delta}^{(r_{n-1})}}$
 $D_f = ? \rightarrow (1, r]$

الف) $y = \log(2\cos x + 1) \rightarrow 2\cos x + 1 > 0 \rightarrow \cos x > -\frac{1}{2}$

$$\text{b.) } y = \sqrt{\log \frac{n-1}{n+1}} \rightarrow \frac{n-1}{n+1} > 0 \quad \text{Df}$$

$$\log \frac{n-1}{n+1} > 0 \rightarrow \frac{n-1}{n+1} \geq 1 \rightarrow \frac{-2}{n+1} > 0 \quad \text{Df} = (-\infty, -1)$$