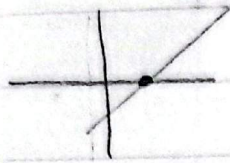


$$f(n) = \sqrt{(a-r)n^2 + an + b} \quad [r, +\infty)$$

(1)



$a = r$ $f(n) = \sqrt{rn + b}$ $\rightarrow n = r$ $r + b = 0 \rightarrow b = -r$ (2)

$$f(n) = \sqrt{x^2 + 2n + 2 \cdot n^2} \rightarrow \Delta \leq 0 \rightarrow 4 - 4(2 - n^2) \leq 0 \rightarrow 4 - 8 + 4n^2 \leq 0$$

$$\rightarrow 4n^2 - 4 \leq 0 \rightarrow 4(n^2 - 1) \leq 0 \rightarrow 4(n+1)(n-1) \leq 0$$

$$\rightarrow P = [-1, 1] \rightarrow 1 - (-1) = 2$$
 (3)

$$f(n) = \frac{\sqrt{4 - n^2}}{[n] + [-n] + 1} \rightarrow 4 - n^2 \geq 0 \rightarrow (2-n)(2+n) \geq 0$$

$$\rightarrow [n] + [-n] + 1 \neq 0 \rightarrow [n] + [-n] \neq -1 \rightarrow n \notin \mathbb{Z}$$

$$\rightarrow P_f = \{-2, -1, 0, 1, 2\} \rightarrow \text{مجموعه}$$
 (4)

الف) $y = \sqrt{n^2 + 3n^2} = \sqrt{n^2(n+3)} \rightarrow n^2(n+3) \geq 0$

$$\rightarrow \frac{-3}{-1} \quad \frac{0}{0} \quad \frac{0}{0} \quad \frac{0}{0} \rightarrow P = [-3, +\infty)$$
 (5)

$$ب) y = \sqrt{\frac{(n^2-1)(n^2-3n^2)}{n^2-1}} = \sqrt{\frac{(n-1)(n+1)n^2(n-3)}{(n-1)(n^2+1+n)}} \rightarrow \frac{n(n-1)(n+1)(n-3)}{(n-1)(n^2+1+n)} \geq 0$$

$$\rightarrow n \neq 0 \quad n = 1 \quad n = -1 \quad n = 3$$

$$\rightarrow P = (-\infty, -1] \cup [3, +\infty) \cup \{0\}$$
 (6)

ج) $y = \sqrt{|n-2| \cdot 3} \rightarrow |n-2| \cdot 3 \geq 0 \rightarrow |n-2| \geq 0 \rightarrow n-2 \geq 0 \rightarrow n \geq 2$

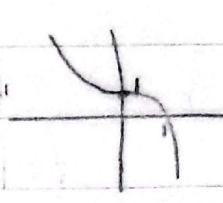
$$\rightarrow n-2 \leq -3 \rightarrow n \leq -1$$

$$\rightarrow P = (-\infty, -1] \cup [2, +\infty)$$
 (7)

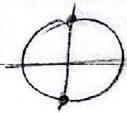
د) $y = \sqrt{4 - 9|2-n|} \rightarrow 4 - 9|2-n| \geq 0 \rightarrow |2-n| \leq \frac{4}{9} \rightarrow 2-n \leq \frac{4}{9} \rightarrow n \geq -\frac{2}{9}$

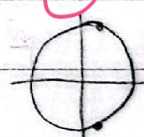
$$\rightarrow 2-n \geq \frac{4}{9} \rightarrow n \leq \frac{14}{9}$$

$$\rightarrow P = [-\frac{2}{9}, \frac{14}{9}]$$
 (8)

$\therefore 1) y = \sqrt{1 - n/n}$ $\xrightarrow{\text{domain}}$ $\begin{cases} n > 0 \rightarrow 1 - n^2 \\ n = 0 \rightarrow 1 \\ n < 0 \rightarrow 1 - n^2 \end{cases}$ $\rightarrow$  ⑨
 $\rightarrow D_f = (-\infty, 1]$

$\therefore 1) y = \frac{1}{\sqrt{r - |n - \omega|} - 1}$ $\rightarrow r - |n - \omega| \geq 0 \rightarrow |n - \omega| \leq r \rightarrow -r \leq n - \omega \leq r \rightarrow r \leq n \leq 1$
 $\rightarrow \sqrt{r - |n - \omega|} - 1 \neq 0 \rightarrow \sqrt{r - |n - \omega|} \neq 1 \rightarrow r - |n - \omega| \neq 1$
 $\rightarrow |n - \omega| \neq r \rightarrow n - \omega \neq r \rightarrow n \neq r + \omega$
 $\rightarrow n - \omega \neq -r \rightarrow n \neq -r + \omega$
 $\rightarrow D_f = [r, 1] - \{r, -r\}$ ⑩

$\therefore 1) y = \frac{\sin^2 n - 1}{\cos n}$ $\rightarrow \cos n \neq 0 \rightarrow$  $\rightarrow D_f = \mathbb{R} - \{k\pi + \frac{\pi}{2}\}$ ⑪

$\therefore 1) y = \frac{\cos n}{r \cos n - 1}$ $\rightarrow (r \cos n - 1) \neq 0 \rightarrow r \cos n \neq 1 \rightarrow \cos n \neq \frac{1}{r}$ 
 $\rightarrow D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{r}\}$

$\therefore 1) y = \frac{n + r}{|r n + 1| - |n + r|}$ $\rightarrow |r n + 1| - |n + r| \neq 0 \rightarrow |r n + 1| \neq |n + r|$ ⑫

$\rightarrow (r n + 1) + (n + r) \neq (r n + 1) - (n + r) \rightarrow r n^2 - r n - 1 \neq 0$
 $\rightarrow r n^2 - r n - 1 \neq 0 \rightarrow (n - 1)(n + 1) \neq 0 \rightarrow n \neq 1 \rightarrow n \neq -1$
 $\rightarrow D_f = \mathbb{R} - \{r - \frac{1}{r}\}$

$\therefore 1) y = \sqrt{|r n + 1| - |n + r|}$ $\rightarrow |r n + 1| - |n + r| \geq 0 \rightarrow |r n + 1| \geq |n + r|$ ⑬
 $\rightarrow (r n + 1) + (n + r) \geq (r n + 1) - (n + r) \rightarrow r n^2 - r n - 1 \geq 0 \rightarrow r n^2 - r n - 1 \geq 0$
 $\rightarrow (n - 1)(n + 1) \geq 0 \rightarrow \frac{-\frac{1}{r}}{+0 - 0 +} \rightarrow D_f = \left[-\frac{1}{r}, \frac{1}{r}\right] \cup [r, \infty)$

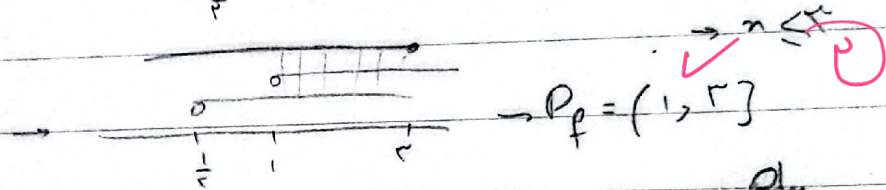
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$$f(n) = \sqrt{\log_{\frac{1}{2}} \log_a^{(r_{n-1})}}$$

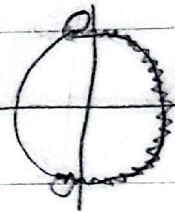
$$\rightarrow r_{n-1} > 0 \rightarrow r_n > 1 \rightarrow n > \frac{1}{r}$$

$$\rightarrow \log_{\frac{1}{2}}^{r_{n-1}} > 0 \rightarrow r_{n-1} > 1 \rightarrow r_n > 2 \rightarrow n > 1$$

$$\log_{\frac{1}{2}}^{r_{n-1}} \geq 0 \rightarrow \log_0^{r_{n-1}} < 1 \rightarrow r_{n-1} \leq 0 \rightarrow r_n \leq 1$$



$$\text{ii) } y = \log(r \cos n + 1) \rightarrow r \cos n + 1 > 0 \rightarrow r \cos n > -1/r$$



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$$\rightarrow D_f = (r \cos \pi - \frac{1}{r}, r \cos \pi + \frac{1}{r})$$

$$\text{ii) } y = \sqrt{\log \frac{n-1}{n+1}}$$

$$\rightarrow \frac{n-1}{n+1} > 0 \rightarrow \frac{-1}{+} - \frac{1}{+} \rightarrow (-\infty, -1) \cup (1, +\infty)$$

$$\log \frac{n-1}{n+1} \geq 0 \rightarrow \frac{n-1}{n+1} \geq 1 \rightarrow \frac{n-1-n-1}{n+1} \geq 0$$

$$\rightarrow \frac{-2}{n+1} \geq 0 \rightarrow n+1 < 0 \rightarrow n < -1$$

