

① (vi)
$$\frac{r_n^p + r_n^r - \Lambda n + p}{-r_n^p + r_n^r} \mid \frac{\lambda - 1}{r_n^p + r_n^r - \Lambda n + p} \quad \& \quad \frac{\lambda + p}{r_n^p + r_n^r - \Lambda n + p}$$
$$\frac{\Delta \lambda - \Lambda n + p}{-\Delta n^p + \Delta n} \quad \hookrightarrow \quad \frac{-\Delta \pm \sqrt{\Delta^2 + 4\Delta p}}{p} \quad \begin{cases} \frac{1}{r} \\ -p \end{cases}$$
$$D_f = \mathbb{R} - \left\{ \frac{1}{r}, -p, 1 \right\}$$

$\frac{1}{x^2} = x^{-2}$
 $\frac{d}{dx} x^{-2} = -2x^{-3}$
 $= -\frac{2}{x^3}$

$$\begin{array}{r|l} x^2 + 9x + 10 & x+1 \\ -x^2 - 5x & \\ \hline 4x + 10 & \end{array}$$

$$\frac{x + \mu}{(x+1)(\mu^n + \nu_n + \mu)} \rightarrow \frac{-\nu \pm \sqrt{\nu^2 - \mu^2}}{\mu} \cdot \frac{1}{\mu - \nu}$$

$$P_f = \mathbb{R} - \left\{ -\frac{1}{f}, \frac{1}{f}, 0 \right\}$$

الف) (٢) $2+10$

$$\begin{array}{r} x^k - x^{k-1} + x^{k-1} - 1 \rightarrow \frac{x^k - x^{k-1} + x^{k-1} - 1}{x^k - x^{k-1} + x^{k-1} - 1} \cdot \frac{x-1}{x-1} \\ \hline \frac{-x^k + x^{k-1} + x^{k-1} - 1}{x^k - x^{k-1} + x^{k-1} - 1} \cdot \frac{x-1}{x-1} \\ \hline \frac{-x^k + x^{k-1} + x^{k-1} - 1}{x^k - x^{k-1} + x^{k-1} - 1} \cdot \frac{x-1}{x-1} \\ \hline \frac{-x^k + x^{k-1} + x^{k-1} - 1}{x^k - x^{k-1} + x^{k-1} - 1} \cdot \frac{x-1}{x-1} \end{array}$$

$$D_f = \mathbb{R} - \{1\}$$

$$\therefore \sqrt{\frac{n \cdot k}{n - k + k - 1}}$$

$$\begin{array}{c|cc} -\infty & 1 & \infty \\ \hline + & - & + \end{array} \quad (-\infty, \frac{1}{2}] \cup (1, \infty)$$

⑦ $n \geq 1 \quad \frac{r}{n^r - v_{n+1}} = \frac{r}{(n-r)(n-r)}$

$$\lambda = 1 \quad \frac{r}{r_c}$$

$$n \rightarrow 1 \quad \frac{1}{n + \epsilon_n} = \frac{1}{n(n + \epsilon)}$$

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

$$① \quad [-x] - 2 \geq 0 \quad [-x] \geq 2 \quad -x \geq 2 \rightarrow x \leq -2$$

$$ب) \quad \frac{5x^2 + 4}{(x-3)(x+1)} \quad [x] = -1 \rightarrow -1 < x < 0$$

$$[x] = 2 \rightarrow 2 \leq x < 3$$

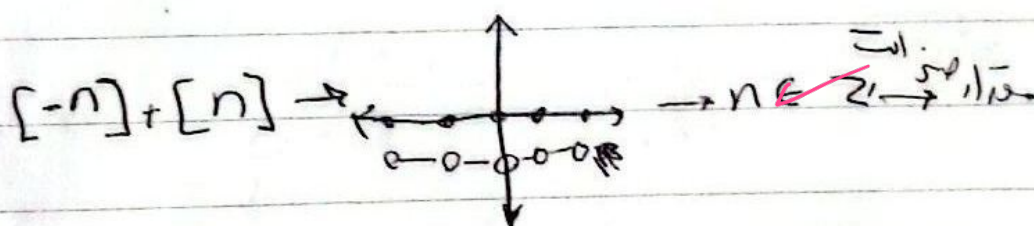
$$D_f = \mathbb{R} - \{[-1, 0) \cup [2, 3)\}$$

$$⑤ \quad [x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 0 \xrightarrow{+1} 2[x + \frac{1}{x}] \geq 1$$

كامل زاهل بنوس!

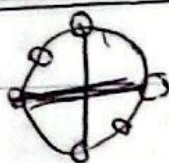
$$\rightarrow [x + \frac{1}{x}] \geq \frac{1}{2} \rightarrow [x + \frac{1}{x}] \geq 1 \quad x + \frac{1}{x} \geq 1 \rightarrow x \geq \frac{1}{x}$$

$$ب) \quad [x - \frac{1}{x}] + [\frac{1}{x} - x] \geq 0 \Rightarrow x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}$$



$$⑥ \quad \cot x + 1$$

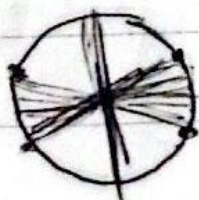
$$\Leftrightarrow \tan x + 1$$



$$\hookrightarrow \tan x = -1 \rightarrow x = 2k\pi - \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}$$

$$D_f = \mathbb{R} - \left\{ \frac{k\pi}{2}, 2k\pi - \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4} \right\}$$

$$ب) \quad 1 - \sin^2 x \geq 0 \quad \sin^2 x \leq \frac{1}{4} \rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$$



$$D_f = [k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}]$$

(V) ا) $r \sin n - 1 > 0 \rightarrow \sin n > \frac{1}{r}$

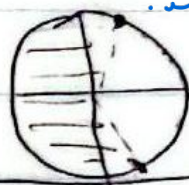


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$$D_f = \left[r\pi + \frac{\pi}{4}, r\pi + \frac{3\pi}{4} \right]$$

نباید آخر بازه اول بازه دوم را باشد!

ب) $1 - r \cos n > 0 \rightarrow \cos n < \frac{1}{r}$

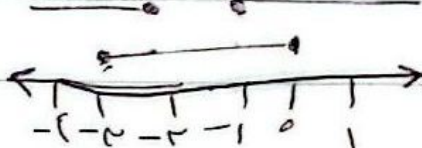


$$D_f = \left[r\pi + \frac{\pi}{3}, r\pi + \frac{2\pi}{3} \right]$$

(A) ا) $-1 < x^2 + 3x + 1 < 1 \rightarrow x^2 + 3x < 0 \rightarrow x(x+3) < 0$ ①

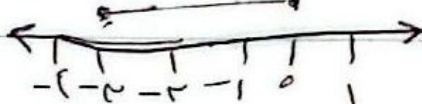
$\rightarrow x^2 + 3x + 2 > 0 \rightarrow (x+1)(x+2) > 0$ ②

① $\frac{-3}{+|-|+}$



$\rightarrow [-3, 0]$

② $\frac{-2}{+|-|+}$



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ب) $1 - \sqrt{5 - 2n} < 1 \rightarrow 5 - 2n < 1 \rightarrow n > 2$ I
 $\downarrow$
 $5 - 2n > 0 \rightarrow n < \frac{5}{2}$ II
 $I \cap II \rightarrow 2 < n \leq \frac{5}{2}$

(9) ا) $1 - \log_n > 0 \rightarrow \log_n < 1 \rightarrow n < 10$

$0 < n < 10$

$D_f = (0, 10)$

1, 0

ب) $1 - \log_{\frac{1}{r}} > 0 \rightarrow \log_{\frac{1}{r}} < 1 \rightarrow r < \frac{1}{10}$

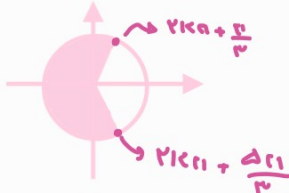
(10) ا) $\frac{r}{r} \in \omega_1 \rightarrow r \in \omega_1$
 $\rightarrow r^2 - 1 > 0 \rightarrow (r-1)(r+1) > 0$
 $\rightarrow r < -1$ or $r > 1$
 $\rightarrow r > 1$ (since $r > 0$)
 $\rightarrow r > 1$ (since $r > 0$)

ب) $\frac{r_n + \delta}{r_n + \epsilon} \in \omega_1 \rightarrow r \in \frac{r_n + \delta}{r_n + \epsilon}$
 $\rightarrow \left| \frac{r_n + \delta}{r_n + \epsilon} - r \right| < \frac{1}{r}$

$$5- \text{الف}) \left\lfloor n - \frac{1}{r} \right\rfloor + \left\lfloor n + \frac{r}{r} \right\rfloor \geq 0 \xrightarrow{+1} \left\lfloor n - \frac{1}{r} \right\rfloor + 1 + \left\lfloor n + \frac{r}{r} \right\rfloor \geq 1$$

$$\left\lfloor n + \frac{r}{r} \right\rfloor + \left\lfloor n + \frac{r}{r} \right\rfloor \geq 1 \rightarrow \left\lfloor n + \frac{r}{r} \right\rfloor \geq \frac{1}{2} \xrightarrow[\text{اولین عدد صحیح بزرگتر از}]{\text{نه برابر یک است!}} n + \frac{r}{r} \geq 1$$

$$n \geq \frac{1}{r} \rightarrow D_f = \left[\frac{1}{r}, +\infty \right)$$

$$6- \text{ب}) 1 - r \cos n \geq 0 \rightarrow \cos n \leq \frac{1}{r} \rightarrow D_f = \left[rkn + \frac{\pi}{r}, rkn + \frac{2\pi}{r} \right]$$


$$7- \text{الف}) y = \log_r (1 - \log_r^n) \rightarrow \log_r^n \rightarrow n > 0$$

$$\rightarrow 1 - \log_r^n > 0 \rightarrow \log_r^n < 1 \rightarrow n < r$$

$$D_f = (0, r)$$

$$8- \text{ب}) y = \log_r \left(1 - \log_r^n \frac{1}{r} \right) \rightarrow \log_r^n \frac{1}{r} \rightarrow n > 0$$

$$\rightarrow 1 - \log_r^n \frac{1}{r} > 0 \rightarrow \log_r^n \frac{1}{r} < 1 \xrightarrow[\text{متناسب}]{\left(\frac{1}{r}, 0 \right)} n > \frac{1}{r}$$

$$D_f = \left(\frac{1}{r}, +\infty \right)$$