

الف) $y = \frac{n+3}{2n^3+2n^2-1n+3} \Rightarrow 2n^3+2n^2-1n+3 \neq 0 \Rightarrow$ بخش پذیر (n-1)

$$\begin{array}{r} 2n^3+2n^2-1n+3 : n-1 \\ \underline{2n^3-2n^2} \\ 4n^2-1n+3 \\ \underline{4n^2-4n} \\ 3n+3 \\ \underline{3n-3} \\ 6 \end{array}$$

 $2n^3+2n^2-1n+3 = (n-1)(2n^2+4n+6) = (n-1)2(n+3)$
 $y = \frac{n+3}{2(n-1)(n+3)} = \frac{1}{2(n-1)}$
 $D_y = \mathbb{R} - \{1\}$

ب) $y = \frac{n+3}{2n^3+9n^2+10n+3} \Rightarrow 2n^3+9n^2+10n+3 \neq 0 \Rightarrow$ بخش پذیر (n+1)

$$\begin{array}{r} 2n^3+9n^2+10n+3 : n+1 \\ \underline{2n^3+2n^2} \\ 7n^2+10n+3 \\ \underline{7n^2+7n} \\ 3n+3 \\ \underline{3n+3} \\ 0 \end{array}$$

 $2n^3+9n^2+10n+3 = (n+1)(2n^2+7n+3) = (n+1)(2n+3)(n+1)$
 $y = \frac{n+3}{(n+1)^2(2n+3)}$

الف) $y = \frac{n+3}{n^3-2n^2+2n-1} \Rightarrow n^3-2n^2+2n-1 \neq 0 \Rightarrow$ بخش پذیر (n-1)

$$\begin{array}{r} n^3-2n^2+2n-1 : n-1 \\ \underline{n^3-n^2} \\ -n^2+2n-1 \\ \underline{-n^2+n} \\ -n-1 \\ \underline{-n-1} \\ 0 \end{array}$$

 $n^3-2n^2+2n-1 = (n-1)(n^2-n-1)$
 $y = \frac{n+3}{(n-1)(n^2-n-1)}$

ب) $y = \frac{n+3}{n^3-2n^2+2n-1} \Rightarrow n^3-2n^2+2n-1 \neq 0 \Rightarrow$ بخش پذیر (n-1)

$$\begin{array}{r} n^3-2n^2+2n-1 : n-1 \\ \underline{n^3-n^2} \\ -n^2+2n-1 \\ \underline{-n^2+n} \\ -n-1 \\ \underline{-n-1} \\ 0 \end{array}$$

 $n^3-2n^2+2n-1 = (n-1)(n^2-n-1)$
 $y = \frac{n+3}{(n-1)(n^2-n-1)}$

$D_y = \mathbb{R} - \{-3, 2, 5\}$
 $y = \frac{2}{n^2-7n+10} \Rightarrow n^2-7n+10 \neq 0 \Rightarrow (n-2)(n-5) = 0$
 $n=2, n=5$
 $n^2-7n+10 = (n-2)(n-5)$
 $y = \frac{2}{(n-2)(n-5)}$
 $D_y = \mathbb{R} - \{2, 5\}$

الف) $y = \sqrt{[-n]-2} \Rightarrow \sqrt{[-n]-2} \geq 0 \Rightarrow [-n]-2 \geq 0 \Rightarrow [-n] \geq 2 \Rightarrow$
 $n \leq -2$
 $D_y = (-\infty, -2]$

ب) $y = \frac{5n^2+4}{[n]^2-2[n]-3} \Rightarrow [n]^2-2[n]-3 \neq 0 \Rightarrow ([n]-3)([n]+1) \neq 0$
 $[n] \neq 3, [n] \neq -1$
 $D_y = \mathbb{R} - \{3, -1\}$

الف) $y = \sqrt{[n-\frac{1}{2}]+[n+\frac{1}{2}]} = \sqrt{[n-\frac{1}{2}]+[n+\frac{1}{2}]} = \sqrt{2[n]}$
 $[n-\frac{1}{2}]+[n+\frac{1}{2}] \geq 0$
 $D_y = \mathbb{R} \Rightarrow \frac{1}{2} \Rightarrow D_y = [\frac{1}{2}, +\infty)$

ب) $y = \sqrt{[n-\frac{1}{2}]+[n+\frac{1}{2}]} \Rightarrow [n-\frac{1}{2}]+[n+\frac{1}{2}] \geq 0$
 $D_y = \mathbb{Z}$

باید حیزه
 اعلا سمع
 باشد!
 صد داریم:
 $[n] + [-n] \geq 2 \Rightarrow n \geq \frac{1}{2}$
 $[n] + [-n] \geq -1 \Rightarrow n \geq -\frac{1}{2}$
 $D \neq \{n | n = k + \frac{1}{2}, k \in \mathbb{Z}\}$

$$\textcircled{1} \text{ ب) } \frac{12x^3 + 9x^2 + 6x + 3}{12x^3 + 12x^2} \mid x+1 \rightarrow \boxed{x=1}$$

$$\frac{12x^3 + 9x^2 + 6x + 3}{12x^3 + 12x^2} = \frac{12x^3 + 12x^2 + 9x^2 + 6x + 3}{12x^3 + 12x^2} = \frac{12x^3 + 12x^2 + 9x^2 + 6x + 3}{12x^3 + 12x^2} = \frac{12x^3 + 12x^2 + 9x^2 + 6x + 3}{12x^3 + 12x^2}$$

$$D_y = \mathbb{R} - \left\{ -1, -\frac{1}{2}, 3 \right\}$$

$$\begin{aligned} x_1 &= 1 \\ x_2 &= \frac{7}{2} + 3 \\ x_3 &= -\frac{1}{2} = -\frac{1}{2} \end{aligned}$$

$$\textcircled{2} \text{ الف) } \frac{x^3 - 2x^2 + 2x - 1}{x^3 - x^2} \mid x-1 \rightarrow \boxed{x=1}$$

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

$$D_y = \mathbb{R} - \left\{ 1, \frac{1+\sqrt{5}}{2}, \frac{1-\sqrt{5}}{2} \right\}$$

$$\textcircled{2} \text{ ب) } \frac{x^3 - 2x^2 + 2x - 1}{x^3 - x^2} \mid x-1 \rightarrow \boxed{x=1}$$

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

$$D_y = \mathbb{R} - \left\{ 1, \frac{1+\sqrt{5}}{2}, \frac{1-\sqrt{5}}{2} \right\}$$

$$\frac{x+3}{x^3 - 2x^2 + 2x - 1} = \frac{-3}{0} + \frac{1}{0.5} + \frac{1}{0.5} + \frac{1}{0.5} \Rightarrow D_y = (-\infty, -3] \cup (1, +\infty)$$

$$\textcircled{2} \text{ الف) } x^3 - 2x^2 + 2x - 1 = 0 \xrightarrow[\text{نقش پذیر بر } x-1]{\text{عوامل ضربی صفر است}} (x-1)(x^2 - x + 1) = 0$$

$$\begin{cases} x-1=0 \rightarrow x=1 \\ x^2 - x + 1 = 0 \xrightarrow{\Delta < 0} \text{ریشه حقیقی ندارد} \end{cases} \rightarrow D_f = \mathbb{R} - \{1\}$$

$$\textcircled{2} \text{ ب) } \frac{x+3}{x^3 - 2x^2 + 2x - 1} \geq 0 \rightarrow \frac{x+3}{(x-1)(x^2 - x + 1)} \geq 0$$

$$\xrightarrow[\text{عوامل ضربی صفر است (نقش پذیر بر } x-1)]{\text{عوامل ضربی صفر است}} \xrightarrow{\Delta < 0} \text{ریشه ندارد!}$$

$$\frac{-3}{+0} - \frac{1}{-0} + \frac{1}{+0} \rightarrow D_f = (-\infty, -3] \cup (1, +\infty)$$

الف) $y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \begin{cases} \cot x \neq -1 \Rightarrow x \neq k\pi + \frac{3\pi}{4} \\ \tan x \neq -1 \Rightarrow x \neq k\pi + \frac{5\pi}{4} \end{cases} \Rightarrow D_y = \mathbb{R} - \{k\pi + \frac{3\pi}{4}, k\pi + \frac{5\pi}{4}\}$

ب) $y = \sqrt{1 - \epsilon \sin^2 x} \Rightarrow 1 - \epsilon \sin^2 x \geq 0 \Rightarrow \epsilon \sin^2 x \leq 1 \Rightarrow \sin^2 x \leq \frac{1}{\epsilon}$
 $\frac{1}{\epsilon} \leq \sin^2 x \leq \frac{1}{\epsilon} \Rightarrow D_y = [k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}]$

الف) $y = \sqrt{2 \sin x - 1} \Rightarrow 2 \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2} \Rightarrow D_y = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$

ب) $y = \sqrt{1 - 2 \cos x} \Rightarrow 1 - 2 \cos x \geq 0 \Rightarrow \cos x \leq \frac{1}{2} \Rightarrow D_y = [2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3}]$

الف) $y = \arcsin(x^2 + 2x + 1) \Rightarrow x^2 + 2x + 1 \in [-1, 1] \Rightarrow D_y = [-1, 0] \cup [1, 2]$

ب) $\cos y = \sqrt{5 - 2x} \Rightarrow 5 - 2x \in [0, 1] \Rightarrow D_y = [2, 5]$

الف) $y = \log_y(1 - \log_x^n)$
 $D_y = (0, 1) \cup (1, \infty)$
 ب) $y = \log_y(1 - \log_{\frac{1}{y}}^n)$
 $D_y = (0, 1)$

الف) $y = \sqrt{\frac{\epsilon x - x^2}{1 - x^2}} \Rightarrow \frac{\epsilon x - x^2}{1 - x^2} \geq 0 \Rightarrow D_y = [0, 1]$

ب) $y = \left(\frac{x + \omega}{x + \epsilon}\right)! \Rightarrow \frac{x + \omega}{x + \epsilon} \in \mathbb{N} \Rightarrow D_y = \{x \mid x + \omega = k(x + \epsilon)\}$

$$① ب) 0 \leq \omega - r_m \leq 1 \Rightarrow$$

$$r_m \leq \omega$$

$$n \leq r_m \omega$$

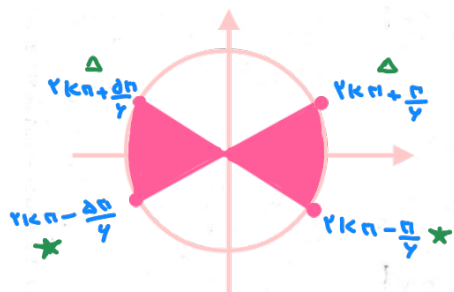
$$r_m > \omega \Rightarrow n > r$$

$$D_y = [r, r, \omega]$$

$$② ب) r_m - r_k n = f_k - \omega \Rightarrow n(r - r_k) = f_k - \omega \Rightarrow n = \frac{f_k - \omega}{r - r_k}$$

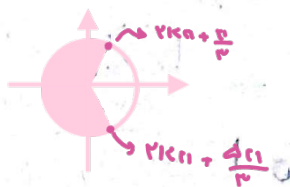
$$D_y = \left\{ \frac{f_k - \omega}{r - r_k} \mid k \in W \right\}$$

$$٩- ب) 1 - r \sin n \geq 0 \rightarrow r \sin n \leq 1 \rightarrow \sin n \leq \frac{1}{r} \rightarrow -\frac{1}{r} \leq \sin n \leq \frac{1}{r}$$



$$\rightarrow D_\varphi = \left[k\pi - \frac{\pi}{r}, k\pi + \frac{\pi}{r} \right]$$

$$٧- ب) 1 - r \cos n \geq 0 \rightarrow r \cos n \leq 1 \rightarrow \cos n \leq \frac{1}{r}$$



$$\rightarrow D_\varphi = \left[r_k n + \frac{\pi}{r}, r_k n + \frac{\pi}{r} \right]$$

$$٩- الف) y = \log_r (1 - \log_r^n) \rightarrow \log_r^n \rightarrow n > 0$$

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

$$D_\varphi = (0, r)$$

$$9 \text{ - ب) } y = \log_r \left(1 - \log^{\frac{n}{r}} \right) \rightarrow \log^{\frac{n}{r}} \rightarrow n > 0.$$

$$\hookrightarrow 1 - \log^{\frac{n}{r}} > 0 \rightarrow \log^{\frac{n}{r}} < 1 \xrightarrow{\text{مناسبة (0,1)}} n > \frac{1}{r}$$

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

$$10 \text{ - الف) } \frac{f_{n-n^2}}{2} - 1 \geq 0 \rightarrow \frac{f_{n-n^2}}{2} \geq 1 \rightarrow f_{n-n^2} \geq 2 \rightarrow$$

$$n^2 - 2n + 2 \leq 0 \rightarrow (n-1)(n-2) \leq 0. \quad \begin{array}{c} 1 \quad 2 \\ + \mid - \mid + \end{array} \rightarrow Df = [1, 2]$$