

① الف) $y = \frac{x + 3}{x^2 + 3x^2 - 14x + 3} \rightarrow y = \frac{1}{x^2 + 3x^2 - 14x + 3} \rightarrow x^2 + 3x^2 - 14x + 3 = 0 \rightarrow 4x^2 - 14x + 3 = 0$ جميع قيم x

$$\frac{r_{u,u}^w + r_{u,u}^r - 1u + r}{-r_{u,u}^w + r_{u,u}^r} \cdot \frac{(u-1)}{r_{u,u}^w + 6u - 10} \rightarrow 1$$

ب) $y = \frac{x + 3}{2x^3 + 9x^2 + 10x + 3} \rightarrow y = \frac{1}{\Sigma} \rightarrow \Sigma \neq 0 \rightarrow 2x^3 + 9x^2 + 10x + 3 \neq 0 \rightarrow$ جميع قيم x مسموح بها

$$\begin{array}{r} x^u + 9x^r + 1 \cdot x + 10 \\ - x^u + -x^r \\ \hline x^r + 1 \cdot x \\ - x^r - x \\ \hline x + 10 \end{array} \quad \begin{array}{l} (x+1) \rightarrow -1 \\ x^r + x + 10 \rightarrow (x+1)(x+9) \end{array} \quad \begin{array}{l} u = -10 \\ u = -\frac{1}{r} \end{array}$$

⑤ (د) $y = \frac{u+1}{u^3 - ru^2 + ru - 1} \rightarrow y = \frac{1}{\Sigma} \rightarrow \{ \neq 0 \rightarrow u^3 - ru^2 + ru - 1 \neq 0 \rightarrow \text{مخرج صفری نیست}$

$$\begin{array}{r} n^w - n^r + n - 1 \mid n - 1 \sim 1 \\ - n^r + n^r \\ \hline - n^r + n^r \\ + n^r - n \\ \hline n - 1 \end{array} \quad \begin{array}{l} n - 1 \sim 1 \\ n^r - n + 1 \rightarrow \Delta \langle 0 \end{array} \quad \text{Qd: } \cancel{12-13}$$

$$c) = y = \sqrt{\frac{n+1}{n^2 - n + 1}} \quad \text{and} \quad \frac{n+1}{(n^2 - n + 1)(n-1)} \quad \text{for } n \neq 1$$

$$\begin{aligned}
 \textcircled{p} \quad y &= \frac{1}{x} \rightarrow x \neq 0 \rightarrow x^r - b|x-1| - rx + b \neq 0 \rightarrow \frac{x^r - rx + b}{x^r + bx - b - rx} \quad x^r - bx + b - rx + b \\
 &\quad \frac{x^r - rx + b}{x^r + bx} \quad | \quad x^r - rx + b \quad \rightarrow \quad x^r - rx + b \neq 0 \quad (x-b)(x-r) \begin{cases} x \neq r \\ x \neq b \end{cases}
 \end{aligned}$$

$$\begin{aligned} \rightarrow u^r + wu &\neq 0 \rightarrow u(u+w) \neq 0 \begin{cases} u \neq 0 \\ u \neq -w \end{cases} \\ \rightarrow \underline{u^r - ru + b} &\rightarrow \Delta < 0 \end{aligned}$$

(5) (a) $y = \sqrt{[x] - 2} \rightarrow [x] - 2 \geq 0 \rightarrow [x] \geq 2 \rightarrow (-\infty, 2]$

b) $y = \frac{\delta u^2 + 4}{[u]^2 - 2[u] - 4} = f' - 2f - 4 = 0 \quad (f-2)(f+1) \begin{cases} f-1 \rightarrow [u] = -1 \\ f-2 \rightarrow [u] = 2 \end{cases}$
 $R = ([-1, 0) \cup [2, \infty))$

⑤ $y = \sqrt{\left[x - \frac{1}{e}\right] + \left[2x + \frac{1}{e}\right]} \geq 0 \rightarrow \left[x + \frac{1}{e}\right] \geq 1 \rightarrow \left[x + \frac{1}{e}\right] \geq \frac{1}{1} = \left[x + \frac{1}{e}\right] \geq 1$
 $x + \frac{1}{e} \geq 1 \rightarrow x \geq \frac{e-1}{e}$

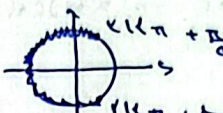
$$y = \sqrt{[n - \frac{1}{n}] + [\frac{1}{n} - n]} \longrightarrow [a] + [-a] \geq 0 \longrightarrow a \in \mathbb{Z} \rightarrow [a] + [-a] = 0 \checkmark \rightarrow n - \frac{1}{n} \in \mathbb{Z}$$

Def: $\{u | u = k + \frac{1}{p}, k \in \mathbb{Z}\}$

$$④ \text{ ا) } y = \frac{\cot u + 1}{\tan u + 1} \quad \left\{ \begin{array}{l} \text{① } \tan u + 1 \rightarrow u \neq \frac{\pi}{2} \text{ و } \frac{3\pi}{2} \\ \text{② } \sin u \neq 0 \rightarrow u \neq 0 \text{ و } \pi \\ \text{③ } \cos u \neq 0 \rightarrow u \neq \frac{\pi}{2} \text{ و } \frac{3\pi}{2} \end{array} \right\} \quad \text{Def: } \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi - \frac{\pi}{2} \right\}$$

$$\text{ب) } 1 - 2\sin u \rightarrow \sin u \leq \frac{1}{2} \rightarrow -\frac{1}{2} \leq \sin u \leq \frac{1}{2} \rightarrow \text{Def: } \left[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6} \right]$$

$$⑤ \text{ ا) } y = \sqrt{r \sin u - 1} \rightarrow r \sin u - 1 \geq 0 \rightarrow \sin u \geq \frac{1}{r} \rightarrow \text{Def: } \left[k\pi + \frac{\pi}{6}, k\pi + \frac{5\pi}{6} \right]$$

$$\text{ب) } y = \sqrt{1 - r \cos u} \rightarrow 1 - r \cos u \geq 0 \rightarrow \cos u \leq \frac{1}{r} \rightarrow \text{Def: } \left[k\pi + \frac{\pi}{3}, k\pi + \frac{5\pi}{3} \right]$$


$$① y = \arcsin(u^2 + u + 1) \rightarrow -1 \leq u^2 + u + 1 \leq 1 \rightarrow \begin{array}{l} u^2 + u + 1 \leq 1 \rightarrow \frac{-1}{2} \leq u \leq 0 \\ u^2 + u + 1 \geq -1 \rightarrow u \geq -2 \end{array} \rightarrow \text{Def: } [-2, 0]$$

$$\text{ب) } \cos y = \sqrt{b - ku} \rightarrow \begin{array}{l} \text{① } b - ku \geq 0 \rightarrow u \leq \frac{b}{k} \\ \text{② } -1 \leq \sqrt{b - ku} \leq 1 \rightarrow \begin{array}{l} \text{③ } b - ku \leq 1 \rightarrow u \geq \frac{b-1}{k} \\ \text{④ } b - ku \geq -1 \rightarrow u \leq \frac{b+1}{k} \end{array} \end{array} \xrightarrow{\text{ن}} \text{Def: } \left[\frac{b-1}{k}, \frac{b}{k} \right]$$

$$\text{① } y = \log_r \left(\frac{1 - \log_r u}{1 - \log_r \frac{1}{r}} \right) \rightarrow \begin{array}{l} \text{I) } u > 0 \\ \text{II) } 1 - \log_r u > 0 \rightarrow \log_r u < 1 \rightarrow u < r \end{array} \rightarrow \text{Def: } (0, r)$$

$$y = \log_r \left(\frac{1 - \log_r \frac{1}{r}}{1 - \log_r \frac{1}{r}} \right) \rightarrow \begin{array}{l} u > 0 \\ 1 - \log_r u > 0 \rightarrow \log_r u < 1 \rightarrow u < r \end{array} \rightarrow \text{Def: } (0, r)$$

$$\text{② } y = \sqrt{r^{2u} - r^u} \rightarrow \begin{array}{l} r^{2u} - r^u \geq 0 \rightarrow r^u(r^u - 1) \geq 0 \rightarrow r^u - 1 \geq 0 \rightarrow r^u \geq 1 \rightarrow u \geq 0 \end{array} \rightarrow \text{Def: } [0, \infty)$$

$$\text{ب) } y = \left(\frac{u^2 + 2}{u^2 + 2} \right)^{\frac{1}{2}} \rightarrow \frac{u^2 + 2}{u^2 + 2} \in \mathbb{R} \rightarrow \text{Def: } \{u \mid u \in \mathbb{R}\}$$