

$$الف) y = \frac{x+3}{x^2+x^2-10x+3} = \frac{x+3}{(x-1)(x+3)(x-1)} \Rightarrow$$

$$Df = \mathbb{R} - \{1, -3, -3\}$$

$$\begin{array}{r} x^2+x^2-10x+3 \mid x-1 \\ -x^2+x^2 \\ \hline -10x+3 \end{array}$$

$$\begin{array}{r} -10x+3 \mid x-1 \\ -10x+10 \\ \hline -7 \end{array}$$

$$\begin{array}{r} -7 \mid x-1 \\ -7x+7 \\ \hline 10x-4 \end{array}$$

$$\begin{array}{r} 10x-4 \mid x-1 \\ -10x+10 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 14 \mid x-1 \\ -14x+14 \\ \hline 14x-14 \end{array}$$

$$\begin{array}{r} 14x-14 \mid x-1 \\ -14x+14 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 0 \mid x-1 \\ 0 \end{array}$$

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$$ب) y = \frac{x+3}{x^2+x^2-10x+3} = \frac{x+3}{(x-1)(x+3)(x-1)} \Rightarrow$$

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

$$\begin{array}{r} x^2+x^2-10x+3 \mid x-1 \\ -x^2+x^2 \\ \hline -10x+3 \end{array}$$

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$$\begin{array}{r} 10x-4 \mid x-1 \\ -10x+10 \\ \hline 14 \end{array}$$

$$\begin{array}{r} 14 \mid x-1 \\ -14x+14 \\ \hline 14x-14 \end{array}$$

$$\begin{array}{r} 14x-14 \mid x-1 \\ -14x+14 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 0 \mid x-1 \\ 0 \end{array}$$

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$$ب) y = \sqrt{\frac{x+3}{x^2+x^2-10x+3}} \Rightarrow \sqrt{\frac{x+3}{(x-1)(x^2-x+1)}} \Rightarrow$$

$$Df = \mathbb{R} - \{1\} \text{ or } (-\infty, -3] \cup (1, +\infty)$$

$$\frac{-3}{1} \mid \frac{1}{x-1}$$

$$y = \frac{1}{x^2-5x+6} \xrightarrow{x-1 \geq 0 \Rightarrow x \geq 1} \frac{1}{x^2-5x+6} = \frac{1}{(x-2)(x-3)}$$

$$x-1 < 0 \Rightarrow x < 1 \xrightarrow{\quad} \frac{1}{x^2-5x+6} = \frac{1}{x^2+3x} \xrightarrow{\quad} \frac{1}{x(x+3)}$$

$$Df = \mathbb{R} - \{0, 2, 3, -3\}$$

$$y = \sqrt{[-x] \cdot 2} \Rightarrow [-x] \geq 2 \Rightarrow x \in (-\infty, -2] \Rightarrow Df$$

$$y = \frac{0x^2+y}{(x)^2-2(x)-2} \Rightarrow \frac{0x^2+y}{(x)^2-2(x)-2} \Rightarrow \begin{cases} (x)^2-2=0 \rightarrow x = (2, \infty) \\ (x)^2+1=0 \rightarrow x \in (-1, 0) \\ (x)^2=-1 \end{cases}$$

$$Df = \mathbb{R} - \{[-1, 0) \cup (2, \infty)\} \text{ or } \rightarrow (-\infty, -1) \cup (0, 2) \cup (2, +\infty)$$

$$y = \sqrt{\left(x - \frac{1}{x}\right) \left(x + \frac{1}{x}\right)} \Rightarrow \left(x - \frac{1}{x}\right) \left(x + \frac{1}{x}\right) \geq 0 \xrightarrow{+1} \begin{cases} x \left(x + \frac{1}{x}\right) \geq 1 \\ \left(x + \frac{1}{x}\right) \geq \frac{1}{x} \end{cases}$$

$$y = \sqrt{\left(x - \frac{1}{x}\right) \left(\frac{1}{x} - x\right)} \Rightarrow \left(x - \frac{1}{x}\right) \left(\frac{1}{x} - x\right) \geq 0 \xrightarrow{-1} \begin{cases} x \left(x - \frac{1}{x}\right) \geq -1 \\ x - \frac{1}{x} \geq -1 \end{cases}$$

$$\hookrightarrow \frac{1}{\sqrt{x+1}} \cdot \frac{1}{\sqrt{x-1}} \Rightarrow a \in \mathbb{Z} \rightarrow x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}$$

$$Df = \{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\}$$

$$\text{الف) } y = \frac{\cot x + 1}{\tan x + 1}$$

$$\rightarrow \textcircled{1} \tan x + 1 = 0$$

$$\tan x = -1$$

$$\textcircled{2} \tan x, \cot x \text{ مبنیٰ}$$



$x \in \mathbb{R}$

$$Df = \mathbb{R} - \left\{ \frac{r\pi}{f} - \frac{\pi}{f}, \frac{r\pi}{f} + \frac{\pi}{f}, \frac{r\pi}{f} \right\}$$

$$\text{ب) } y = \sqrt{1 - f \sin^2 x} \rightarrow$$

$$1 \geq f \sin^2 x$$

$$\frac{1}{f} \geq \sin^2 x \rightarrow -\frac{1}{f} \leq \sin x \leq \frac{1}{f}$$



$$Df = \left\{ k\pi \pm \frac{\pi}{f} \right\}$$

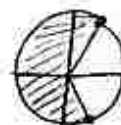
$$\text{الف) } y = \sqrt{r \sin x - 1} \Rightarrow r \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{r}$$

$$Df = \left[\frac{r\pi}{r} + \frac{\pi}{r}, \frac{r\pi}{r} + \frac{\pi}{r} \right]$$



$$\text{ب) } y = \sqrt{1 - r \cos x} \Rightarrow 1 - r \cos x \geq 0 \rightarrow \cos x \leq \frac{1}{r}$$

$$Df = \left[\frac{r\pi}{r} + \frac{\pi}{r}, \frac{r\pi}{r} + \frac{\pi}{r} \right] \text{ or } \mathbb{R} - \left(\frac{r\pi}{r} + \frac{\pi}{r}, \frac{r\pi}{r} + \frac{\pi}{r} \right)$$



$$\text{الف) } y = \arcsin(x^2 + 3x + 1) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1$$

$$\frac{x(x+3)}{x^2+3x+1} < 0 \rightarrow \frac{-3}{x^2+3x+1} < 0 \quad (x+1)(x+2) > 0$$

$$Df = [-3, -2] \cup [-1, 0]$$

$$\text{ب) } \cos y = \sqrt{0 - 2x}$$

$$0 - 2x \geq 0 \rightarrow x \leq 0$$

$$\textcircled{1} x \leq \frac{0}{2}$$

$$-1 \leq \sqrt{0 - 2x} \leq 1 \rightarrow 0 - 2x \leq 1$$

$$\textcircled{2} f \leq 2x \rightarrow x \geq \frac{f}{2} \Rightarrow [r, \frac{0}{f}]$$

$$\text{الف) } y = \log_{\frac{1}{2}}(1 - \log_{\frac{1}{2}} x)$$

$$\rightarrow x > 0$$

$$1 - \log_{\frac{1}{2}} x > 0 \rightarrow 1 > \log_{\frac{1}{2}} x$$

$$\rightarrow x > \frac{1}{2}$$

$$\Rightarrow x > \frac{1}{2}$$

$$Df = (0, \frac{1}{2})$$

$$\text{ب) } y = \log_{\frac{1}{2}}(1 - \log_{\frac{1}{2}} \frac{x}{\frac{1}{2}})$$

$$\rightarrow x > 0$$

$$1 - \log_{\frac{1}{2}} \frac{x}{\frac{1}{2}} > 0 \rightarrow 1 > \log_{\frac{1}{2}} \frac{x}{\frac{1}{2}}$$

$$\rightarrow \frac{1}{2} < x$$

$$\rightarrow x > \frac{1}{2}$$

$$Df = (\frac{1}{2}, +\infty)$$

$$y = \sqrt{\frac{f x - x^2}{r - x}}$$

$$\frac{f x - x^2}{r - x} \geq 0$$

$$\rightarrow f x - x^2 \geq 0$$

$$\rightarrow x^2 - f x + r \leq 0$$

$$(x-1)(x-r) \leq 0$$

$$Df = [1, r]$$

$$y = \left(\frac{r x + \delta}{r x + f} \right)!$$

$$\frac{r x + \delta}{r x + f} \in \omega$$

$$\rightarrow x = \frac{f \omega - \delta}{r \omega - r}$$

$$\rightarrow x = \frac{0 - f \omega}{r \omega - r}$$

$$Df = \left\{ x \mid x = \frac{0 - f \omega}{r \omega - r}, \omega \in \omega \right\}$$

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