

$$2x^3 + 3x^2 - 11x + 3 \mid x-1$$

(۱)

الف) $y = \frac{x+3}{2x^3 + 3x^2 - 11x + 3}$

$$\begin{array}{r} -2x^3 + 2x^2 \\ \hline 5x^2 - 11x + 3 \end{array}$$

$$\begin{array}{r} -5x^2 + 5x \\ \hline -6x + 3 \end{array}$$

$$\begin{array}{r} -6x + 6 \\ \hline -3x + 3 \end{array}$$

$$\begin{array}{r} -3x + 3 \\ \hline 0 \end{array}$$

$$+3x - 3$$

مجموع ضرایب
صفر می شود.

$$\frac{x+3}{2x^3 + 3x^2 - 11x + 3} = \frac{x+3}{(x-1)(2x^2 + 5x - 3)} \Rightarrow \frac{x+3}{(x-1)(x-1)(x+3)} \Rightarrow D_f: \mathbb{R} - \left\{1, -3, \frac{1}{2}\right\}$$

ب) $y = \frac{x+3}{2x^3 + 9x^2 + 10x + 3} \Rightarrow \frac{x+3}{(x+1)(x+1)(x+3)} \Rightarrow D_f: \mathbb{R} - \left\{-1, -\frac{1}{2}, -3\right\}$

مجموع ضرایب توان
زوج و فرد برابرند

$$\begin{array}{r} 2x^3 + 9x^2 + 10x + 3 \mid x+1 \\ -2x^3 - 2x^2 \\ \hline 11x^2 + 10x + 3 \\ -11x^2 - 11x \\ \hline 21x + 3 \\ -21x - 21 \\ \hline 24x + 24 \\ -24x - 24 \\ \hline 0 \end{array}$$

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

(۲)

مجموع ضرایب صفر می شود.

① $\downarrow$
سازگار

$$\begin{array}{r} x^3 - 2x^2 + 2x - 1 \mid x-1 \\ -x^3 + x^2 \\ \hline -x^2 + 2x - 1 \\ +x^2 - x \\ \hline -x - 1 \\ -x - 1 \\ \hline 0 \end{array}$$

زنگنه اسادات حسینی

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

① (مشتق می‌گیرد)

مجموعه تمام ضرایب

مفروضه شود

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

از استاندارد هست

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$$f = \frac{x^2 - \omega|x-1| - 2x + \omega}{x^2} \Rightarrow \text{ضابطه بندش من لیم}$$

$$x^2 - \omega + \omega x - 2x + \omega = 0$$

$$x^2 + 13x = 0$$

$$\boxed{x=0} \quad \boxed{x=-13}$$

$$x^2 - \omega x + \omega - 2x + \omega = 0$$

$$x^2 - 17x + 10 = 0$$

$$(x-1)(x-10) = 0$$

$$\boxed{x=1} \quad \boxed{x=10}$$

این حالت دیگر هم وجود دارد اگر $\boxed{x=1}$ در این حالت هم مخرج صفر نشود پس مشکل ندارد.

$$\boxed{x=1} \Rightarrow 1 - 2 + \omega = 0$$

و اما دامنه تابع که باید به کمک ریشه های مخرج مشخص شود.

$$D_f = \mathbb{R} - \{0, -1, 1, 10\}$$



Senobar

$$x - 1$$

نوعی ساده است

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$$y = \sqrt{[-x] - 2} \Rightarrow [-x] \geq 2 \Rightarrow -x \geq 2 \Rightarrow x \leq -2$$

$$y = \frac{ax^2 + 4}{[x]^2 - 2[x] - 3} \quad [x]^2 - 2[x] - 3 = 0 \quad [x] = -1 \Rightarrow x = [-1, 0)$$

$$[x] = -\frac{c}{a} = 3 \Rightarrow x = [3, 4)$$

$$D_f = \mathbb{R} - \{[-1, 0) \cup [3, 4)\}$$

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الف) $y = \sqrt{\left[x - \frac{1}{3}\right] + \left[x + \frac{2}{3}\right]} - 1$

$$\sqrt{2\left[x + \frac{1}{3}\right]} - 1 \Rightarrow 2\left[x + \frac{1}{3}\right] - 1 \geq 0 \Rightarrow \left[x + \frac{1}{3}\right] \geq \frac{1}{2} \Rightarrow x + \frac{1}{3} \geq \frac{1}{2}$$

$$\Rightarrow x \geq \frac{1}{6} \Rightarrow D_f = \left[\frac{1}{6}, +\infty\right)$$

ب) $y = \sqrt{\left[x - \frac{1}{3}\right] + \left[\frac{1}{3} - x\right]} \Rightarrow \begin{cases} \text{if } x \in \mathbb{Z} & [x] + [-x] = 0 \quad \checkmark \\ \text{if } x \notin \mathbb{Z} & [x] + [-x] = -1 \quad \text{ممنوع} \end{cases}$

$$\Rightarrow x - \frac{1}{3} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z} + \frac{1}{3} \Rightarrow D_f = \left\{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\right\}$$

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

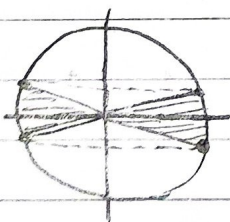
(I) $\Rightarrow \cot = \frac{\cos}{\sin} \Rightarrow \sin \neq 0$ 

(II) $\Rightarrow \tan = \frac{\sin}{\cos} \Rightarrow \cos \neq 0$ 

(III) $\Rightarrow \tan x + 1 \neq 0 \Rightarrow \tan \neq -1$ 

$$D_f : (I) \cup (II) \cup (III) \Rightarrow \mathbb{R} - \left\{k\pi, k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4}\right\}$$

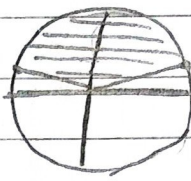
ب) $y = \sqrt{1 - 4\sin^2 x} \Rightarrow 1 - 4\sin^2 x \geq 0 \Rightarrow 1 \geq 4\sin^2 x \Rightarrow \sin^2 x \leq \frac{1}{4} \Rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$



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

✓

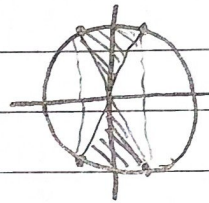
الف) $y = \sqrt{r \sin \alpha} - 1 \Rightarrow r \sin \alpha \geq 1 \Rightarrow \sin \alpha \geq \frac{1}{r}$



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

ب) $y = \sqrt{1 - 2\alpha} \Rightarrow 1 - 2\alpha \geq 0 \Rightarrow 2\alpha \leq 1 \Rightarrow \alpha \leq \frac{1}{2}$

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



1

الف) $y = \arcsin(x^2 + 2x + 1) \Rightarrow -1 \leq \sin \alpha \leq 1 \Rightarrow -1 \leq x^2 + 2x + 1 \leq 1 \Rightarrow$

$$\begin{cases} x^2 + 2x + 1 \leq 1 \Rightarrow x^2 + 2x \leq 0 \Rightarrow x(x+2) \leq 0 \Rightarrow \frac{-2}{-1-2} \leq x \leq \frac{0}{0+2} \Rightarrow [-2, 0] \end{cases}$$

$$\begin{cases} x^2 + 2x + 1 \geq -1 \Rightarrow x^2 + 2x + 2 \geq 0 \Rightarrow x = -1 \Rightarrow \frac{-1}{-1-1} \leq x \leq \frac{1}{1-1} \Rightarrow (-\infty, -1] \cup [-1, +\infty) \end{cases}$$

$$\Rightarrow \frac{-2}{-1-2} \leq x \leq \frac{0}{0+2} \Rightarrow [-2, 0]$$

ب) $y = \sqrt{5 - 2x} \Rightarrow -1 \leq \sqrt{5 - 2x} \leq 1 \Rightarrow 0 \leq 5 - 2x \leq 1 \Rightarrow$

$$0 \leq 5 - 2x \leq 1 \Rightarrow -5 \leq -2x \leq -4 \Rightarrow 2 \leq x \leq 5 \Rightarrow \boxed{2 \leq x \leq 5}$$

$$D_f = \left[2, 5 \right]$$

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الف) $y = \log_r \left(\frac{1 - \log_r x}{r} \right) \Rightarrow 1 - \log_r x \geq 0 \Rightarrow \log_r x \leq 1 \Rightarrow x \leq r$

$$x > 0 \Rightarrow D_f = (0, r)$$



$$b) \log_r \left(1 - \log_{\frac{1}{r}} x \right) \Rightarrow \begin{cases} x \geq 0 \\ 1 - \log_{\frac{1}{r}} x > 0 \Rightarrow \log_{\frac{1}{r}} x < 1 \Rightarrow x < \frac{1}{r} \end{cases} \quad D_f^2 \left(0, \frac{1}{r} \right)$$

$$الف) y: \sqrt{r^{rx-x^r}} - 1 \Rightarrow r^{rx-x^r} \geq 1 \Rightarrow rx - x^r \geq 0 \Rightarrow x^r - rx + r \leq 0 \Rightarrow$$

$$\boxed{x \geq 1} \quad \boxed{x \leq \frac{r}{a} \leq r}$$

$$\frac{1}{+ \phi} - \frac{r}{\phi +}$$

$$\Rightarrow [1, r]$$

$$ج) y: \left(\frac{rx + \omega}{rx + r} \right)! \Rightarrow \frac{rx + \omega}{rx + r} \in \omega \Rightarrow \frac{r(\omega - \omega)}{r\omega - r} = x \Rightarrow x = \frac{\omega - r\omega}{r\omega - r}$$

$$D_f = \left\{ x \mid x = \frac{rk - \omega}{r - rk}, k \in \omega \right\}$$