

الف) $x^3 + 3x^2 - 8x + 3 = 0 \Rightarrow (x-1)(x^2 + 4x - 3) = 0 \Rightarrow \Delta = 25 + 12 = 37 \Rightarrow x = \frac{-4 \pm \sqrt{37}}{2}$

ب) $x^3 + 9x^2 + 14x + 3 = 0 \Rightarrow (x+1)(x^2 + 8x + 3) = 0 \Rightarrow \Delta = 64 - 12 = 52 \Rightarrow x = \frac{-8 \pm \sqrt{52}}{2}$

ج) $x^3 - 2x^2 + 2x - 1 = 0 \Rightarrow (x-1)(x^2 - x + 1) = 0 \Rightarrow \Delta = 1 - 4 = -3 \Rightarrow$ ریشه حقیقی ندارد!

د) $x^3 - 2x^2 + 2x - 1 = 0 \Rightarrow (x-1)(x^2 - x + 1) = 0 \Rightarrow \Delta = 1 - 4 = -3 \Rightarrow$ ریشه حقیقی ندارد!

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

ج) $x^3 - 2x^2 + 2x - 1 = 0 \Rightarrow (x-1)(x^2 - x + 1) = 0 \Rightarrow \Delta = 1 - 4 = -3 \Rightarrow$ ریشه حقیقی ندارد!

الف) $x^2 - 5|x| + 6 = 0 \Rightarrow (x-2)(x-3) = 0 \Rightarrow x = 2, 3$

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الف) $x - \frac{1}{x} \geq 0 \Rightarrow x \geq \frac{1}{x} \Rightarrow x^2 \geq 1 \Rightarrow x \leq -1 \text{ or } x \geq 1$

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الف) $x \neq \frac{\mu}{r} + ku$

ب) $\tan x + 1 \neq 0 \rightarrow \tan x \neq -1 \Rightarrow x \neq -\frac{\pi}{4} + ku$

ج) $\cot x = \frac{1}{\tan x} \Rightarrow x \neq ku$

د) $1 - r \sin^2 x \geq 0 \Rightarrow r \sin^2 x \leq 1 \Rightarrow \sin^2 x \leq \frac{1}{r} \Rightarrow -\frac{1}{\sqrt{r}} \leq \sin x \leq \frac{1}{\sqrt{r}}$

هـ) $D_f = \left\{ [ku, ku + \frac{\mu}{r}] \cup [ku + \frac{\mu}{r}, ku + \frac{\mu}{r}] \cup [ku + \frac{\mu}{r}, ku + \mu] \right\}$

الف) $r \sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{r}$

ب) $D_f = \left\{ [\frac{\mu}{r} + ku, \mu + ku] \right\}$

الف) $1 - r \cos x \geq 0 \rightarrow \cos x \leq \frac{1}{r}$

ب) $D_f = \left\{ [\frac{\mu}{r} + ku, \mu + ku] \right\}$

الف) $-1 \leq x^2 + 3x + 1 \leq 1$

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

ج) $x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \rightarrow -3 \leq x \leq 0$

د) $D_f = [-3, -2] \cup [-1, 0]$

الف) $0 \leq \sqrt{5-2x} \leq 1$

ب) $0 \leq \sqrt{5-2x} \rightarrow x \leq \frac{5}{2}$

ج) $\sqrt{5-2x} \leq 1 \rightarrow x \geq 2$

د) $D_f = [2, \frac{5}{2}]$

الف) $1 - \log_3 x \geq 0 \Rightarrow \log_3 x \leq 1 \rightarrow x \leq 3$ و $x > 0$

ب) $D_f = (0, 3]$

الف) $1 - \log_{\frac{1}{r}} x \geq 0 \rightarrow \log_{\frac{1}{r}} x \leq 1 \rightarrow x \leq \frac{1}{r}$ و $x > 0$

ب) $D_f = (\frac{1}{r}, +\infty)$

الف) $x^2 - 4x + 3 \geq 0 \rightarrow x^2 - 4x + 3 \geq 0 \rightarrow (x-1)(x-3) \leq 0$

ب) $D_f = [1, 3]$

الف) $2x + 6 \neq 0 \rightarrow x \neq -3$

ب) $\frac{3x + 5}{2x + 6} \geq 0 \Rightarrow 3x + 5 = n(2x + 6) \Rightarrow x = \frac{2n - 5}{3 - 2n} \rightarrow 3 - 2n \neq 0 \rightarrow n \neq \frac{3}{2}$

ج) $D_f = \left\{ \frac{2n - 5}{3 - 2n} \mid n \in \mathbb{Z} \right\}$

$$۲- \text{ب}) \frac{x+3}{x^3 - 2x^2 + 2x - 1} \geq 0 \rightarrow \frac{x+3}{(x-1)(x^2 - x + 1)} \geq 0$$

↪ صفر ضرایب عبارت (نقش پیدا کردن برای $x-1$)
رسیده ندارد! $\Delta < 0$

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

۳- کس عبارت مخرج را دستکاری می‌کنیم تا کس ساده تر شود...

$$(x^2 - 2x + 1) - \omega |x-1| + 4 \rightarrow (x-1)^2 - \omega |x-1| + 4 \xrightarrow{|x-1|=t} t^2 - \omega t + 4$$

$$(t-1)(t-4) = 0 \rightarrow t=1, t=4$$

$$\rightarrow D_f = \mathbb{R} - \{-3, 0, 2, \omega\}$$

$$|x-1|=1 \rightarrow x=2, 0 \quad |x-1|=4 \rightarrow x=5, -3$$

$$۴- \text{الف}) [-n] - 2 \geq 0 \rightarrow [-n] \geq 2 \rightarrow -n \geq 2 \rightarrow n \leq -2 \rightarrow D_f = (-\infty, -2]$$

$$۵- \text{ب}) \left[n - \frac{1}{p} \right] + \left[-n + \frac{1}{p} \right] \geq 0$$

می‌دانیم:

$$[n] + [-n] \begin{cases} \hookrightarrow n \in \mathbb{Z} & 0 \checkmark \\ \hookrightarrow n \notin \mathbb{Z} & -1 \times \end{cases}$$

$$\rightarrow \left[n - \frac{1}{p} \right] \in \mathbb{Z} \rightarrow n \in \mathbb{Z} + \frac{1}{p}$$

$$D_f = \left\{ n \mid n = k + \frac{1}{p}, k \in \mathbb{Z} \right\}$$

$$۱۰- \text{ب}) \frac{nw + \omega}{2n + 1} \in \mathbb{W} \rightarrow n \in -\frac{nw - \omega}{2w - 2} \rightarrow n \in \frac{\omega - nw}{2w - 2}$$

$$D_f = \left\{ n \mid n = \frac{-k\omega + \omega}{2k - 2}, k \in \mathbb{W} \right\}$$