

سینا طوسی

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$$\text{الف) } y = \frac{x+3}{(x-1)(2x^2+5x-3)} \Rightarrow y = \frac{x+3}{(x-1)(2x-1)(x+3)}$$

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

$$\text{ب) } y = \frac{x+3}{(x+1)(2x^2+5x-3)} \Rightarrow y = \frac{x+3}{(x+1)(x+3)(2x-1)}$$

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

$$\text{ج) } y = \frac{x+3}{(x-1)(x^2-x+1)}$$

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

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

$$\frac{-3}{+ \quad - \quad +}$$

$$D = (-\infty, -3] \cup (1, +\infty)$$

$$\text{if } x > 1 \rightarrow x^2 - 0(x-1) - 2x + 0 \Rightarrow x^2 - 2x + 1 \neq 0 \rightarrow (x-1)(x-1) \neq 0 \rightarrow x \neq 1$$

$$\text{if } x < 1 \rightarrow x^2 - 0(1-x) - 2x + 0 \Rightarrow x^2 + 2x \neq 0$$

$$D = \mathbb{R} - \left\{ -3, 0, 2, 0 \right\}$$

$$\frac{x(x+3)}{-3} \neq 0 \quad x \neq 0, -3$$

$$\text{ه) } [-x] - 2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow -x \geq 2$$

$$x \leq -2$$

$$D = (-\infty, -2]$$

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$$\Rightarrow x^2 - 8x + 13$$

$$1) [x]^2 - 2[x] - 3 \neq 0$$

$$[x] \neq -1 \rightarrow x \neq [-1, 0)$$

$$[x] \neq 3 \rightarrow x \neq [3, 4)$$

$$D = (-\infty, -1) \cup [0, 3) \cup [4, +\infty)$$

$$2) [x - \frac{1}{x}] + [x + \frac{x}{x+1}] \geq 0$$

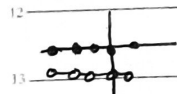
$$[x + \frac{x}{x+1} - 1]$$

$$\rightarrow [x + \frac{x}{x+1}] - 1 + [x + \frac{x}{x+1}] \geq 0 \rightarrow 2[x + \frac{x}{x+1}] \geq 1$$

$$[x + \frac{x}{x+1}] \geq \frac{1}{2}$$

$$x + \frac{x}{x+1} \geq 1 \rightarrow x \geq \frac{1}{x} \quad D = [\frac{1}{x}, +\infty)$$

$$3) [x - \frac{1}{x}] + [\frac{1}{x} - x] \geq 0$$

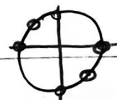


$$x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}$$

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

$$4) \sin x \neq 0 \quad \tan x \neq 1$$

$$\cos x \neq 0$$



$$D = \mathbb{R} - \{ \frac{k\pi}{2}, k\pi - \frac{\pi}{2} \}$$

$$5) 1 - \sqrt{\sin^2 x} \geq 0 \rightarrow (1 + \sqrt{\sin^2 x})(1 - \sqrt{\sin^2 x}) \geq 0$$

$$\sin x = -\frac{1}{x}$$

$$\sin x = \frac{1}{x}$$



$$D = [2k\pi - \frac{\pi}{4}, 2k\pi + \frac{\pi}{4}] \cup [2k\pi + \frac{3\pi}{4}, 2k\pi + \frac{5\pi}{4}]$$



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الف) $r \sin \alpha - 1 \geq 0$

$\sin \alpha \geq \frac{1}{r}$



$D = [r\pi + \frac{\pi}{4}, r\pi + \frac{3\pi}{4}]$

ب) $|r \cos \alpha| \geq 0 \rightarrow r \cos \alpha \leq 1$
 $\cos \alpha \leq \frac{1}{r}$



$D = [r\pi + \frac{\pi}{r}, r\pi + \frac{2\pi}{r}]$

الف) $x^2 + 3x + 1 \leq 1$
 $x^2 + 3x \leq 0$
 $x(x+3) \leq 0$
 $[-3, 0] \quad (I, II)$

$x^2 + 3x + 2 \leq 0$

$x(x+3) \leq 0$

$\frac{-3 \pm \sqrt{9-4}}{2} = \frac{-3 \pm \sqrt{5}}{2}$

$(-\infty, -2] \cup [-1, +\infty) \quad (I)$

$(I) \cap (I, II) \rightarrow [-3, -2] \cup [-1, 0]$

ب) $-1 \leq \sqrt{0-2x} \leq 1$

$0 \leq 0-2x \leq 1$

$-0 \leq -2x \leq -1$

$0 \leq 2x \leq 0$

$0 \leq x \leq 0$

$D = [0, 0]$

الف) $1 - \log_a x > 0 \rightarrow \log_a x < 1$

$x > 0 \quad (I, II)$

$x < a \quad (I)$

$(I) \cap (I, II) \rightarrow D = (0, a)$

ب) $1 - \log_a \frac{1}{r} > 0$

$\log_a \frac{1}{r} < 1$

$x > \frac{1}{r}$

$D = (\frac{1}{r}, +\infty)$



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$x > 0$

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$$\frac{\epsilon n - n^2}{r} - 1 > 0 \quad \frac{\epsilon n - n^2}{r} > 1$$

$$\epsilon n - n^2 > r \rightarrow n^2 - \epsilon n + r < 0$$

$$(n - r)(n - 1) < 0$$

$$D = [1, r]$$



$$\frac{r n + \Delta}{r n + \epsilon} \in W, \quad n \in - \frac{\epsilon W, -\Delta}{r W, -r}$$

$$D = \left\{ n \mid n = \frac{-\epsilon k + \Delta}{r k - r}, k \in W, \right\}$$