

تدوین نهایی تکلیف 3 : سران B : 18 راه حل های نهایی را با دقت بفرست

سوال 1)

$$y = \frac{x^2 + 3}{2x^3 + 5x^2 - 1x + 3} \quad 2x^3 + 5x^2 - 1x + 3 \neq 0$$

$$(x+4)(x-1) \rightarrow \Delta = -4, 1 \rightarrow x^2 + 5x - 4$$

$$\Delta f = \mathbb{R} - \left\{ -\frac{1}{2}, \frac{1}{2} \right\}$$

$$y = \frac{x^2 + 3}{2x^5 + 9x^4 + 10x^3 + 5} \quad 2x^5 + 9x^4 + 10x^3 + 5 \neq 0$$

$$(x+1)(2x^2 + 7x + 5) \rightarrow (x+1)(x^2 + 7x + 4) \rightarrow (x+1)(x+4)(x+1)$$

$$\Delta f = \mathbb{R} - \left\{ -5, -1, -\frac{1}{2} \right\}$$

الف) $y = \frac{x+5}{x^5 - 2x^2 + 2x - 1} \Rightarrow x^5 - 2x^2 + 2x - 1 \neq 0$

$$(x-1)(x^2 + x + 1) \rightarrow \Delta = b^2 - 4ac = 1 - 4 = -3$$

$$\Delta f = \mathbb{R} - \left\{ \frac{1}{2} \right\}$$

ب) $y = \sqrt{\frac{x+3}{x^5 - 2x^2 + 2x - 1}} \quad x^5 - 2x^2 + 2x - 1 \neq 0 \rightarrow (x-1)(x^2 - x + 1)$

$$\Delta f = \mathbb{R} - \left\{ -\frac{1}{2}, +1 \right\}$$

سوال 13

$$y = \frac{2}{x^2 - 2|x-1| - 2x + 2} \quad x^2 - 2x(-x+1) - 2x + 2$$

$$x^2 + 2x - 2 - 2x + 2 = x^2 \neq 0 \quad \Delta = 4 \quad \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \frac{-2 \pm 2}{2} = 0, -2$$

$$x > 0 \rightarrow \frac{2}{x^2 - 2x + 2 - 2x + 2} = \frac{2}{x^2 - 4x + 4} = \frac{2}{(x-2)^2}$$

$$\Delta f = \mathbb{R} - \left\{ -2, 0, 2 \right\}$$

الف) $y = \sqrt{[-x] - 2} \quad [-x] - 2 \geq 0 \quad [-x] \geq 2$

$$\Delta f = (-\infty, -2]$$

ب) $y = \frac{2x^2 + 4}{[x]^2 - 2[x] - 3} \quad [x]^2 - 2[x] - 3 \neq 0 \quad [x] = t \Rightarrow t^2 - 2t - 3 \neq 0$

$$(t-3)(t+1) \neq 0 \quad t \neq 3, -1 \quad \Delta f = \mathbb{R} - \left\{ [-1, 0) \cup [3, 4) \right\}$$

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الف) $\sqrt{x - \frac{1}{x}} + \sqrt{x + \frac{5}{x}} \rightarrow [x - \frac{1}{x}] + [x + \frac{5}{x}] \geq 0$
 $Def = [\frac{1}{5}, +\infty)$

سوال 5:

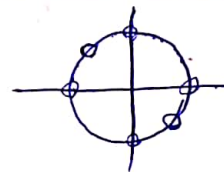
(1)

$\rightarrow \sqrt{x - \frac{1}{x}} + \sqrt{\frac{1}{x} - x} \geq 0 \rightarrow Def = \{\frac{1}{x}\}$
 $[a] + [-a]$ و
 اصل یابین صفر

$\hookrightarrow \text{if } a \geq 2 \rightarrow [a] + [-a] = 0 \checkmark$

$\frac{\cot x + 1}{\tan x + 1} = y \quad \tan x + 1 \neq 0 \rightarrow \tan x \neq -1$

سوال 9:



(1, 2)

$\rightarrow Def = \mathbb{R} - \{x \mid x = \frac{3\pi}{4} + k\pi, x = \frac{7\pi}{4} + k\pi\}$

$y = \sqrt{1 - f \sin^2 x} \rightarrow 1 - f \sin^2 x \geq 0 \quad 1 \geq f \sin^2 x \quad \frac{1}{f} \geq \sin^2 x \rightarrow -\frac{1}{\sqrt{f}} \leq \sin x \leq \frac{1}{\sqrt{f}}$

$\frac{1}{\sqrt{f}} \geq \sin x$ $Def = [2k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}] \cup [2k\pi + \frac{5\pi}{4}, 2k\pi + \frac{7\pi}{4}]$
 نامحدود! غلط نیستی

$y = \sqrt{2 \sin x - 1} \rightarrow 2 \sin x - 1 \geq 0 \quad 2 \sin x \geq 1 \quad \sin x \geq \frac{1}{2}$

سوال 17:

$Def = [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$

(1, 2)

$y = \sqrt{1 - 2 \cos x} \rightarrow 1 - 2 \cos x \geq 0 \quad 1 \geq 2 \cos x$

$\frac{1}{2} \geq \cos x \rightarrow Def = [2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}]$
 انتهای بازه نباید از ابتدای بازه کوچکتر باشد

$y = \arcsin(x^2 + 3x + 1) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \quad 0 \leq x^2 + 3x + 2 \leq 2$

$0 \leq (x+2)(x+1) \leq 2 \quad (x+2)(x+1) \geq 0$

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

$Def = [-2, -1] \cup [0, 1]$

$$\therefore \cos y = \sqrt{d - 2r} \rightarrow -1 \leq \sqrt{d - 2r} \leq 1 \quad 0 \leq \sqrt{d - 2r} \leq 1 \quad \wedge \text{بال}$$

$$0 \leq d - 2r \leq 1 \quad 0 \leq d - 2r \quad + 2r \leq d \quad r \leq \frac{d}{2}$$

$$d - 2r \leq 1 \quad 1 - 2r \leq 0 \quad 1 \leq 2r \quad \frac{1}{2} \leq r$$

$$\text{Def } \left[\frac{1}{2}, \frac{d}{2} \right]$$

$$Pf = \left[\frac{1}{2}, \frac{d}{2} \right] \quad \text{D}$$

الف) $y = \log_r(1 - \log_r^x)$ $1 - \log_r^x > 0$ $1 > \log_r^x$ $Df = (0, r)$: 9 حل

$Df = (0, r)$

ب) $y = \log_r(1 - \log_{\frac{1}{r}}^x)$ $1 - \log_{\frac{1}{r}}^x > 0$ $1 > \log_{\frac{1}{r}}^x$

~~...~~ $Df = (\frac{1}{r}, +\infty)$

الف) $y = \sqrt{r^{rx-r^r}} - 1$ $r^{rx-r^r} - 1 \geq 0$ $r^{rx-r^r} \geq 1$: 10 حل

$r^{rx-r^r} \geq r^r \rightarrow rx - r^r \geq r$ $rx - r^r - r \geq 0$ $rx - r^r + r \leq 0$

$(x-r)(x-1) \leq 0$ $\frac{1}{r-1} \leq x \leq r$ $Df = [1, r]$

ب) $y = \left(\frac{rx+d}{rx+r}\right)!$ $\frac{rx+d}{rx+r} \in \mathbb{N}$ $rx+d \in rx+r$

$rx - rx \in rx - d$ $x(r-r) \in rx - d$ $x \in \frac{rx-d}{r-r}$

$\Rightarrow$ ~~...~~ $Df = \left\{x \mid x = \frac{rx-d}{r-r} \mid x \in \mathbb{N}\right\}$

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

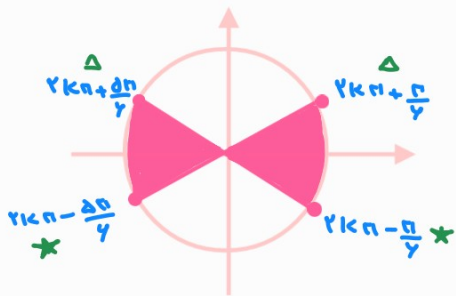
مردانیم:

$[n] + [-n] \rightarrow n \in \mathbb{Z} \quad 0 \checkmark$
 $\hookrightarrow n \notin \mathbb{Z} \quad -1 \times$

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

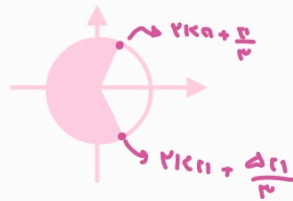
$D_f = \left\{ n \mid n = k + \frac{1}{r}, k \in \mathbb{Z} \right\}$

ب- ۶) $1 - r \sin^2 n \geq 0 \rightarrow r \sin^2 n \leq 1 \rightarrow \sin^2 n \leq \frac{1}{r} \rightarrow -\frac{1}{r} \leq \sin n \leq \frac{1}{r}$



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

ب- ۷) $1 - r \cos n \geq 0 \rightarrow \cos n \leq \frac{1}{r}$



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