یازدهم ریاضی B — تکلیف شماره ۳ — محمدامین جعفری

۱) الف)

$$y=\frac{x+3}{(x-1)(2x^2+5x-3)}=\frac{x+3}{2(x-1)(x+\frac{3}{2})(x-\frac{1}{2})}\Rightarrow D\in \mathbb{R}-\{1,-3,\tfrac{1}{2}\}$$

ب)

$$y=\frac{x+3}{(x+1)(2x^2+7x+3)}=\frac{x+3}{2(x+1)(x+\frac{3}{2})(x+\frac{1}{2})}\Rightarrow D\in \mathbb{R}-\{-1,-3,-\tfrac{1}{2}\}$$

۲) الف)

$$y=\frac{x+3}{x^3-2x^2+2x-1}=\frac{x+3}{(x-1)\underbrace{(x^2-x+1)}_{\Delta<0\Rightarrow \text{ریشه ندارد}}}\Rightarrow D=\mathbb{R}-\{1\}$$

ب)

$$y=\sqrt{\frac{x+3}{(x-1)\underbrace{(x^2-x+1)}_{\Delta<0,\ a>0\Rightarrow \text{همیشه مثبت}}}}$$

$-3 \quad 1$

$+ \ 0 \ - \ | \ +$

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

۳)

$$x^2-5|x-1|-2x+5\neq 0$$

$x<1$	$x\geq 1$
x^2+3x	$x^2-7x+10$
$x(x+3)$	$(x-2)(x-5)$
$x\neq 0$, $x\neq -3$	$x\neq 2$, $x\neq 5$

x^2-2x+5: $\Delta<0\Rightarrow$ ریشه ندارد

$$\Rightarrow D\in\mathbb{R}-\{-3,0,2,5\}$$

۴) الف)

$$|2x+1|-|x+3|\neq 0\Rightarrow|2x+1|\neq|x+3|\Rightarrow 4x^2+4x+1\neq x^2+6x+9$$

$$\Rightarrow 3x^2-2x-8\neq 0\quad \Delta=(-2)^2-4(-8)3=100\Rightarrow x=\frac{2\pm\sqrt{100}}{6}\Rightarrow x=\left\langle{2 \atop -\frac{4}{3}}\right.$$

$$\Rightarrow 3(x-2)(x+\tfrac{4}{3})\neq 0\Rightarrow D=\mathbb{R}-\{-\tfrac{4}{3},2\}$$

ب)

$$|2x+1|-|x+3|\geq 0\Rightarrow|2x+1|\geq|x+3|\Rightarrow 4x^2+4x+1\geq x^2+6x+9$$

$$\Rightarrow 3x^2-2x-8\geq 0\quad \Delta=(-2)^2-4(-8)3=100\Rightarrow x=\frac{2\pm\sqrt{100}}{6}\Rightarrow x=\left\langle{2 \atop -\frac{4}{3}}\right.$$

$-\frac{4}{3} \quad 2$

$+ \ 0 \ - \ 0 \ +$

$$\Rightarrow D\in(-\infty,-\tfrac{4}{3}]\cup[2,+\infty)$$

۵) الف)

$$1-\log_4 x>0\Rightarrow \log_4 x<1\Rightarrow x<4 \quad ①$$

$$x>1 \quad ②$$

$$\xrightarrow{①\cap②} D\in(1,4)$$

ب)

$$1-\log_{\frac{1}{2}} x>0\Rightarrow \log_{\frac{1}{2}} x<1\Rightarrow x>\tfrac{1}{2} \quad ①$$

$$x>1 \quad ②$$

$$\xrightarrow{①\cap②} D\in(1,+\infty)$$

$\log_{5}^{2x-1} > 0 \Rightarrow 2x-1 > 1 \Rightarrow x > 1$ ① 6

$2x-1 > 0 \Rightarrow x > \frac{1}{2}$ ②

$\log_{0.5}^{\log_5^{(2x-1)}} \geq 0 \Rightarrow \log_5^{(2x-1)} \leq 1 \Rightarrow 2x-1 \leq 5 \Rightarrow x \leq 3$ ③

$\xrightarrow{①\cap②\cap③} D_f \in (1, 3]$

الف) $2\cos x + 1 > 0 \Rightarrow 2\cos x > -1 \Rightarrow \cos x > -\frac{1}{2} \Rightarrow D \in \left(2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3}\right)$ 7

ب) $\log \frac{x-1}{x+1} \geq 0 \Rightarrow \frac{x-1}{x+1} \geq 1 \Rightarrow 1 - \frac{2}{x+1} \geq 1 \Rightarrow -\frac{2}{x+1} \geq 0 \Rightarrow \frac{2}{x+1} \leq 0 \Rightarrow x+1 < 0 \Rightarrow x < -1$ ①

$\frac{x-1}{x+1} > 0 \Rightarrow$ $-1 \quad 1$ / $+ \quad - \quad +$ $\quad x \in (-\infty, -1) \cup (1, +\infty)$ ② $\quad \xrightarrow{①\cap②} D \in (-\infty, -1)$

عبارت زیر ریشه ریشه مضاعف دارد $\Rightarrow$ عبارت درجه ۱ است $\Rightarrow a + 2 = 0 \Rightarrow a = -2 \Rightarrow f(x) = \sqrt{-2x+b}$ 8

$\xrightarrow{f(3)=0} \sqrt{-2(3)+b} = \sqrt{-6+b} = 0 \Rightarrow b = 6$

~~$f(x)=\sqrt{x^2+2x+3-m^2}$~~ $x^2+2x+3-m^2 \geq 0 \Rightarrow x^2+2x+1+1-m^2 \geq 0$ 9

$\Rightarrow (x+1)^2+1-m^2 \geq 0 \Rightarrow m^2 \leq (x+1)^2+1 \xrightarrow{(x+1)^2+1 \geq 2} m^2 \leq 2 \Rightarrow -\sqrt{2} \leq m \leq \sqrt{2}$

$\sqrt{2} - (-\sqrt{2}) = \sqrt{2} + \sqrt{2} = 2\sqrt{2}$

$4 - x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow -2 \leq x \leq 2$ ① 10

$[x] + [-x] + 1 \neq \Rightarrow [x] + [-x] \neq -1 \Rightarrow x \in \mathbb{Z}$ ②

قسمت صحیح آن $\Rightarrow x \in \mathbb{Z}$ ③ $\qquad \xrightarrow{①\cap②\cap③} x \in \{-2, -1, 0, 1, 2\}$ ۵ عدد