نام، نام خانوادگی: آیلین عظیمی — تکلیف: ۲ — کلاس: تجربی یازدهم

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$2x^2 + y^2 - 4x + 6y + k = 0 \to \underbrace{2x^2 - 4x + \square}\ + \underbrace{y^2 + 6y + \square} = 0$

$2(x^2 - 2x + \square) + (y+3)^2$

$2(x-1)^2 + (y+3)^2 = 0 \rightsquigarrow$ تابع تک نقطه $(1, -3)$

$2(x^2 - 2x + 1) + y^2 + 6y + 9$

$2x^2 - 4x + 2 + y^2 + 6y + 9 \to k = 2 + 9 = 11$

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$f(x) = \begin{cases} x^2 + 4x & x \geq a \\ 3x + a + 2 & x \leq a \end{cases} \xrightarrow{x=a} a^2 + 4a = 3a + 2$

$a^2 + a - 2 = 0$

$(a+2)(a-1) = 0 \to a = -2$ غ ق ق $a > 0$ ، $a = 1$ ✓ $a > 0$

$\to f(x) = \begin{cases} x^2 + 4x & x \geq 1 \\ 3x + 3 & x \leq 1 \end{cases} \to f(1) = (1)^2 + 4(1) = 5$

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$f(x) = \begin{cases} 2x^2 - b & |x+1| \geq 2 \\ a + 2x & -3 \leq x \leq -1 \end{cases}$

$x \geq 1 \cup x \leq -3$

$|x+1| \geq 2 \to \cup \begin{cases} x + 1 \geq 2 \to x \geq 1 \\ x + 1 \leq -2 \to x \leq -3 \end{cases}$

$\xrightarrow{x=-3} 2(-3)^2 - b = a + 2(-3) \to 18 - b = a - 6 \quad \boxed{a + b = 24}$

۴

$y = \sqrt{6x - a} + \sqrt{b - 3x}$

$D_f = \{2\}$

$\rightsquigarrow \cap \begin{cases} 6x - a \geq 0 \to 6x \geq a \to x \geq \frac{a}{6} \\ b - 3x \geq 0 \to 3x \leq b \to x \leq \frac{b}{3} \end{cases} \quad x = 2 = \frac{a}{6} = \frac{b}{3}$

$a = 12$

$b = 6$

$\boxed{\frac{b}{a} = \frac{1}{2}}$

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الف) $y = \sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{6-x}{x^2+2x+4}} \rightsquigarrow \frac{x+1}{|x-3|} \geq 0 \ \cap\ \frac{6-x}{x^2+2x+4} \geq 0 \to 6 - x \geq 0$

$x \leq 6$

$\Delta = (2)^2 - 16 < 0$ همواره $+$

$x: [-1, +\infty) - \{3\} \quad \boxed{D_f: [-1, 3) \cup (3, 6]}$

ب)

$y = \sqrt{[x] - 4} + \sqrt{2 - [x]}$

$[x] - 4 \geq 0 \to [x] \geq 4 \to x \geq 4$

$2 - [x] \geq 0 \to [x] \leq 2 \to x < 3$

$\cap \to \boxed{D_f = \varnothing}$

الف) $y=\sqrt{\dfrac{x^2-x-6}{x^4-13x^2+36}} \rightarrow \dfrac{(x-3)(x+2)}{(x^2-4)(x^2-9)}\geq 0$

$$\begin{array}{ccccccccc} & -3 & & -2 & & 2 & & 3 & \\ + & | & - & | & - & | & + & | & + \end{array}$$

$\boxed{D_f:(-\infty,-3)\cup(2,3)\cup(3,+\infty)}$ ۶

ب) $y=\sqrt{\dfrac{x^3-2x^2-5x+6}{x^3+2x^2-5x-6}}$ مجموع ضرایب = ۰ ، مجموع ضرایب زوج = فرد

$x-1 \,|\, x^2-x-6=(x-3)(x+2)$

$x+1 \,|\, x^2+x-6=(x+3)(x-2)$

$\rightsquigarrow \dfrac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}\geq 0$

$$\begin{array}{ccccccccccccc} & -3 & & -2 & & -1 & & 1 & & 2 & & 3 & \\ + & | & - & | & + & | & - & | & + & | & - & | & + \end{array}$$

$\boxed{D_f:(-\infty,-3)\cup[-2,-1)\cup[1,2)\cup[3,+\infty)}$

الف) $y=\sqrt{[-x]-2} \rightarrow [-x]-2\geq 0 \rightarrow [-x]\geq 2 \rightarrow -x\geq 2 \rightarrow x\leq -2$ $\boxed{D_f:(-\infty,-2]}$

ب) $y=\dfrac{5x^2+6}{[x]^2-2[x]-3} \rightarrow \dfrac{5x^2+6}{([x]-3)([x]+1)} \rightarrow ([x]-3)([x]+1)\neq 0$ ۷

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

$[x]\neq -1 \rightarrow$ −1 0

−1 0 3 4

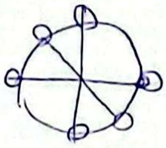
$\boxed{D_f:(-\infty,-1)\cup[0,3)\cup[4,+\infty)}$

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

$\sin x\neq 0$

$\tan x+1\neq 0 \rightarrow \tan x\neq -1$

$\cos x\neq 0$



$\boxed{D_f:\mathbb{R}-\{k\pi, k\pi+\frac{\pi}{2}, k\pi-\frac{\pi}{4}\}}$

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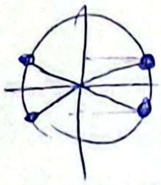
$D_f:\mathbb{R}-\{\frac{k\pi}{2}, k\pi-\frac{\pi}{4}\}$

ب) $y=\sqrt{1-4\sin^2 x} \rightarrow$ ۸

$1-4\sin^2 x\geq 0$

$4\sin^2 x\leq 1$

$\sin^2 x\leq \frac{1}{4} \rightarrow -\frac{1}{2}\leq \sin x\leq \frac{1}{2}$



$\boxed{D_f:[k\pi-\frac{\pi}{6}, k\pi+\frac{\pi}{6}]}$

الف) $y=\sqrt{1-\log_{\frac{1}{2}}^{x-1}}$

$x-1>0 \rightarrow x>1$

$\rightarrow 1-\log_{\frac{1}{2}}^{x-1}\geq 0 \rightarrow \log_{\frac{1}{2}}^{x-1}\leq 1 \rightarrow x-1\geq \frac{1}{2} \rightarrow x\geq \frac{3}{2}$]∩ $x>1$

$\boxed{D_f:[\frac{3}{2},+\infty)}$

ب) $y=\dfrac{\sqrt{x^2-x}}{1-\log_4^{x^2-3x}}$

(I) $x^2-x\geq 0 \rightarrow x(x-1)\geq 0$ $\begin{array}{ccccc} & 0 & & 1 & \\ + & | & - & | & + \end{array} \rightarrow (-\infty,0]\cup[1,+\infty)$

(II) $x^2-3x>0 \rightarrow x(x-3)>0$ $\begin{array}{ccccc} & 0 & & 3 & \\ + & | & - & | & + \end{array} \rightarrow (-\infty,0)\cup(3,+\infty)$

(III) $1-\log_4^{x^2-3x}\neq 0 \rightarrow \log_4^{x^2-3x}\neq 1 \rightarrow x^2-3x\neq 4$

$x^2-3x-4\neq 0 \rightarrow (x-4)(x+1)\neq 0$

$x\neq 4, x\neq -1 \rightarrow \mathbb{R}-\{4,-1\}$

I ∩ II ∩ III ⇒ −1 0 1 3 4

$\boxed{D_f:(-\infty,0)\cup(3,+\infty)-\{-1,4\}}$

الف) $y=\sqrt{2^{4x-x^2}-8} \rightarrow 2^{4x-x^2}-8\geq 0 \rightarrow 2^{4x-x^2}\geq 2^3 \rightarrow 4x-x^2\geq 3 \rightarrow -x^2+4x-3\geq 0$

$x^2-4x+3\leq 0$

$(x-1)(x-3)\leq 0$

$$\begin{array}{ccccc} & 1 & & 3 & \\ + & | & - & | & + \end{array}$$

$\rightarrow \boxed{D_f:[1,3]}$ ۱۰

ب) $y=\left(\dfrac{3x+5}{2x+4}\right)! \rightsquigarrow \dfrac{3x+5}{2x+4}\in W \Rightarrow x=-\dfrac{4w-5}{2w-3} \Rightarrow x=\dfrac{5-4w}{2w-3}$

$\rightarrow \boxed{D_f:\{x \mid x=\frac{5-4k}{2k-3}, k\in W\}}$