نام و نام خانوادگی ......هلیا عطایی...... پاسخنامه تشریحی تکلیف شماره ۲...... کلاس ...یازدهم دختر C...

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$2x^2+y^2-4x+6y+k=0 \to (\sqrt{2}x-\sqrt{2})^2+(y+3)^2=0 \to \begin{cases} x=1 \\ y=-3 \end{cases}$ تابع ناتهی دارای تک نقطه‌ای

$(\sqrt{2}x-\sqrt{2})^2=2x^2+2-4x$

$(y+3)^2=y^2+6y+9$

$\boxed{k=2+9=11}$

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$f(1)=?$

$(a>0)\ ,\ f(x)=\begin{cases} x^2+4x & ; x\geq a \\ 2x+a+2 & ; x\leq a \end{cases}$

$\xrightarrow{x=a} a^2+4a=3a+2$

$a^2+a-2=0 \quad \begin{cases} a=-2 & \text{غ ق ق } (a>0) \\ a=1 & \text{ق ق } \checkmark \end{cases}$

$\xrightarrow{a=1} f(1)=f(a)=1+4=5$

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$a+b=?$

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

$|x+1|\geq 2$

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

$\xrightarrow{x=-3} f(-3): 2(-3)^2-b=a+2(-3)$

$18-b=a-6 \to 24=a+b$

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$\frac{b}{a}=?$

$D_f:\{2\}$

$y=\underbrace{\sqrt{6x-a}}_{\mathrm{I}}{}^{\geq 0}+\underbrace{\sqrt{b-3x}}_{\mathrm{II}}{}^{\geq 0}$

$\mathrm{I}: 6x-a\geq 0 \to x\geq \frac{a}{6}$

$\mathrm{II}: b-3x\geq 0 \to x\leq \frac{b}{3}$

$D_f:\mathrm{I}\cap\mathrm{II}:\{2\} \to \frac{a}{6}=\frac{b}{3}=2 \to \begin{cases} b=6 \\ a=12 \end{cases} \to \frac{b}{a}=\frac{6}{12}=\frac{1}{2}$

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الف) $y=\sqrt{\frac{x+1}{|x-3|}}{}^{\geq 0}_{\neq 0}+\sqrt{\frac{4-x}{x^2+2x+4}}{}^{\geq 0}_{\neq 0}$

$\begin{matrix} x+1=0 \\ |x-3|=0 \end{matrix} \to \mathrm{I}: \begin{array}{c|ccccc} x & & -1 & & 3^* & \\ \hline & - & 0 & + & \nexists & + \end{array} \quad \mathrm{I}:[-1,+\infty)-\{3\}$

$4-x=0 \to \mathrm{II}: \begin{array}{c|ccc} x & & 4 & \\ \hline & + & 0 & - \end{array} \quad \mathrm{II}:(-\infty,4]$

x^2+2x+4 همواره مثبت

$D_f:\mathrm{I}\cap\mathrm{II}:[-1,4]-\{3\}$

$\Delta=b^2-4ac$

$\Delta=4-\overbrace{4(1)(4)}^{16}=-12$

$\Delta<0$
$a>0$ همواره + ریشه ندارد!

ب) $y=\underbrace{\sqrt{[x]-4}}_{\mathrm{I}}+\underbrace{\sqrt{2-[x]}}_{\mathrm{II}}$

$[x]-4\geq 0$

$[x]\geq 4$

$\mathrm{I}: x\geq 4$

$2-[x]\geq 0$

$2\geq [x]$

$\mathrm{II}: 3>x$

$D_f:\mathrm{I}\cap\mathrm{II}:\varnothing$

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الف) $\sqrt{\dfrac{x^2-x-6}{x^4-13x^2+36}}\geq 0$, $x^4-13x^2+36\neq 0$, $t^2-13t+36$, $x^2=t$ $\longrightarrow \sqrt{\dfrac{(x-3)(x+2)}{(t-9)(t-4)}}\geq 0$, $\neq 0$ $\longrightarrow \begin{cases} x=3\,,-2 \\ t=9,4 \to x=\pm 3,\pm 2 \end{cases}$

x		-3		-2^*		2		3^*	
	+	∘	−	∘	−	∘	+	∘	+

$D_f:(-\infty,-3)\cup\left((2,+\infty)-\{3\}\right)$ $D_f:(-\infty,-3)\cup(2,3)\cup(3,+\infty)$ 6

ب) $\sqrt{\dfrac{x^3-2x^2-5x+6}{x^3+2x^2-5x-6}}$ بر ۱ بخش پذیر $a+b+c+d=1-2-5+6=0$, $a+c=b+d=-4$ بر ۱- بخش پذیر $\longrightarrow \sqrt{\dfrac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}}\geq 0$, $\neq 0$ $\to \begin{cases} x=1\,,3\,,-2 \\ x=-1\,,-3\,,2 \end{cases}$

x		-3		-2		-1		1		2		3	
	+	∘	−	•	+	∘	−	•	+	∘	−	•	+

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

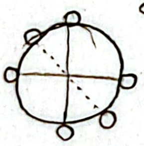
الف) $y=\sqrt{[-x]-2}\geq 0 \xrightarrow[t=-x]{} [t]\geq 2 \longrightarrow t\geq 2 \longrightarrow -x\geq 2 \to x\leq -2$ $D_f:(-\infty,-2]$

ب) $y=\dfrac{5x^2+6}{[x]^2-2[x]-3\neq 0}$ $\xrightarrow{[x]=t} t^2-2t-3\neq 0 \to (t-3)(t+1)\neq 0 \to \begin{cases} t\neq 3 \to [x]\neq 3 \\ t\neq -1 \to [x]\neq -1 \end{cases}$ 7

$\to \begin{cases} x\neq [3,4) \\ x\neq [-1,0) \end{cases}$ $D_f:\mathbb{R}-\left([3,4)\cup[-1,0)\right)$

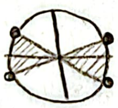
الف) $\dfrac{\cot x+1}{\tan x+1\neq 0}=\dfrac{\dfrac{\cos x+\sin x}{\sin x\neq 0}}{\dfrac{\sin x+\cos x}{\cos x\neq 0}}$

$\begin{cases} \sin x\neq 0 \\ \cos x\neq 0 \\ \tan x\neq -1 \end{cases}$



$D_f:\ \mathbb{R}-\left\{\dfrac{k\pi}{2}\,,\ k\pi-\dfrac{\pi}{4}\right\}$

ب) $y=\sqrt{1-4\sin^2 x}\geq 0$ $\quad 4\sin^2 x\leq 1$, $\sin^2 x\leq \frac14$, $-\frac12\leq \sin x\leq \frac12$



$D_f:\left[k\pi-\dfrac{\pi}{6}\,,\ k\pi+\dfrac{\pi}{6}\right]$ 8

الف) $y=\sqrt{1-\log_{\frac12}^{x-1}}\geq 0$

$\begin{cases} x-1>0 \to x>1:\mathrm{I} \\ 1-\log_{\frac12}^{x-1}\geq 0 \to 1\geq \log_{\frac12}^{x-1} \\ \frac12\leq x-1 \to \frac32\leq x:\mathrm{II} \end{cases}$

چون $0<\frac12<1$ جهت برعکس شود

$D_f:$ $\mathrm{I}\cap\mathrm{II}=\left[\frac32,+\infty\right)$

ب) $y=\dfrac{\sqrt{x^2-x}}{1-\log_4^{x^2-3x>0}\neq 0}\geq 0 \to$ + • − • + $\quad x^2-3x>0\ \ x(x-3)>0$

x		0		3	
	+	∘	−	∘	+

$(-\infty,0)\cup(3,+\infty)$

1) $x^2-x\geq 0 \to x(x-1)\geq 0 \to (-\infty,0]\cup[1,+\infty):\mathrm{I}$

2) $1\neq \log_4^{x^2-3x}\neq 0 \to 4\neq x^2-3x \to x^2-3x-4\neq 0$ 9

$(x-4)(x+1)\neq 0 \to \{x\neq 4,-1$ $\quad \mathrm{II}:\mathbb{R}-\{4,-1\}$

3) $x^2-3x>0 \to \mathrm{III}:(-\infty,0)\cup(3,+\infty)$

$D_f:\mathrm{I}\cap\mathrm{II}\cap\mathrm{III}:(-\infty,0)\cup(3,+\infty)-\{4,-1\}$

الف) $y=\sqrt{2^{4x-x^2}-8}\geq 0$

$2^{4x-x^2}\geq 2^3 \to 4x-x^2\geq 3$

$x^2-4x+3\leq 0 \to (x-1)(x-3)\leq 0$

x		1		3	
	+	•	−	•	+

$\to D_f:[1,3]$

ب) $y=\left(\dfrac{3x+5}{2x+4}\right)!$

$\dfrac{3x+5}{2x+4}\in W \to x\in -\dfrac{4w-5}{2w-3}$ 10

$D_f:\left\{x \mid x=\dfrac{-4k+5}{2k-3}\,,\ k\in W\right\}$