نام و نام خانوادگی ..آرمیتا مستوفی..... پاسخنامه تشریحی تکلیف شماره ۲..... کلاس ..یازدهم ریاضی B..... ۲۵

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$2x^2+y^2-4x+4y+k=0$

$\downarrow$

$(y+3)^2-9+2(x-1)^2-2+k=0$

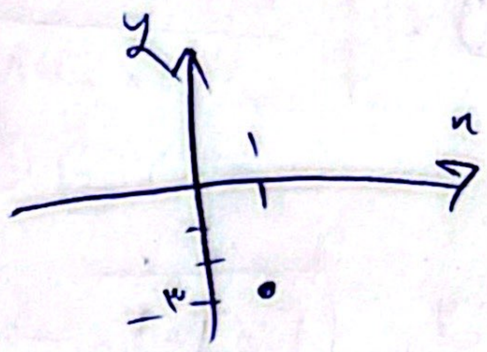
$\downarrow$

$(y+3)^2+2(x-1)^2=11-k$

$(y+3)^2\geq 0$, $2(x-1)^2\geq 0$ $\longrightarrow$ $11-k=0 \rightarrow 11=k$ ✓

تابع تک نقطه

$\frac{11}{3}$



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$f(a)=a^2+4a=3a+2$

$a^2+a-2=0 \rightarrow a=1, a=-2$

$(a+2)(a-1)=0$

$a>0 \longrightarrow a=1$ ✓

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

$\downarrow$

$f(1)=1+4=5$ ✓

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

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

$|x+1|\geq 2 \rightarrow x+1\geq 2 \rightarrow x\geq 1$, $x+1\leq -2 \rightarrow x\leq -3$

$f(-3)=18-b=a-6$

$24=a+b$ ✓

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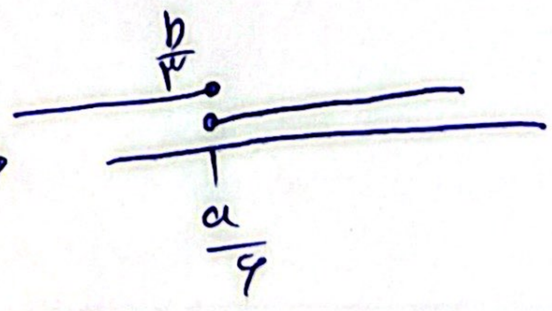
$y=\sqrt{4x-a}+\sqrt{b-3x}$

$\downarrow$

$D_f=\{2\}$

$4x-a\geq 0 \rightarrow x\geq \frac{a}{4}$ (I)

$b-3x\geq 0 \rightarrow \frac{b}{3}\geq x$ (II)



$\Rightarrow \frac{b}{3}=\frac{a}{4}=2$

$\downarrow$

$b=6$, $a=12$ $\rightarrow \frac{b}{a}=\frac{6}{12}=\frac{1}{2}$ ✓

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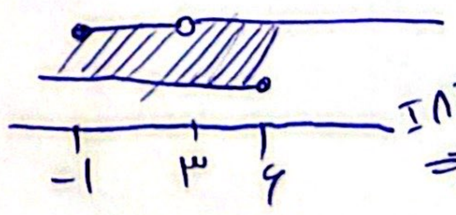
الف) $y=\sqrt{\frac{x+1}{|x-3|}}+\sqrt{\frac{6-x}{x^2+2x+2}}$

$x+1\geq 0 \rightarrow x\geq -1$

$|x-3|\neq 0 \rightarrow x\neq 3$

$x^2+2x+2>0$ $\Delta<0$



$\Rightarrow D_f=[-1,+6]-\{3\}$ ✓

ب) $y=\sqrt{[x]-2}+\sqrt{2-[x]}$

$[x]-2\geq 0 \rightarrow [x]\geq 2 \rightarrow x\geq 2$ (I)

$2-[x]\geq 0$, $2\geq [x] \rightarrow x<3$ (II)

$\Rightarrow D_f=\emptyset$ ✓

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الف) $y = \sqrt{\frac{x^2-x-6}{x^4-13x^2+36}}$ → $\frac{x^2-x-6}{x^4-13x^2+36} \geq 0$

$x^2-x-6 = (x-3)(x+2)$

$x^4-13x^2+36 = (x^2-9)(x^2-4) = (x-3)(x+3)(x-2)(x+2)$

$Df = (-\infty,-3) \cup (-2,2) \cup (3,+\infty)$ ✓

	-3	-2	2	3
	+	∄ −	∄ −	∄ +

ب) $y = \sqrt{\frac{x^3-2x^2-5x+6}{x^3+2x^2-5x-6}}$

$x^3-2x^2-5x+6 = (x-1)(x+2)(x-3)$

$x^3+2x^2-5x-6 = (x+1)(x-2)(x+3)$

	-3	-2	-1	1	2	3
	+ ∄	− 0	+ ∄	− 0	+ ∄	− 0 +

$Df = (-\infty,-3) \cup [-2,-1) \cup [1,2) \cup [3,+\infty)$ ✓

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

$[-x] \geq 2$ → $-x \geq 2$

$x \leq -2$ → $Df = (-\infty,-2]$ ✓

ب) $y = \frac{5x^2+6}{[x]^2-2[x]-3}$ → $[x]^2-2[x]-3 \neq 0$

$([x]-3)([x]+1) \neq 0$

$[x] \neq 3$ → $[3,4)$; $[x] \neq -1$ → $[-1,0)$

	-1	0	3	4
	+ ∄ 0 +	− ∄ 0 +	− ∄ 0 +	

$Df = \mathbb{R} - [[-1,0) \cup [3,4)]$ ✓

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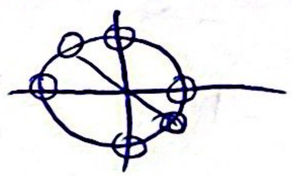
الف) $y = \frac{\cot x+1}{\tan x+1} = \frac{\frac{\cos x}{\sin x}+1}{\frac{\sin x}{\cos x}+1}$

$\cos x, \sin x \neq 0$, $\tan x \neq -1$



→ $Df = \mathbb{R} - \left\{\frac{k\pi}{2}, k\pi-\frac{\pi}{4}\right\}$ ✓

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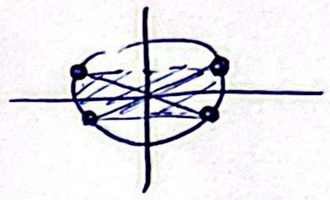
۸) ب) $y = \sqrt{1 - 4\sin^2 x} \rightarrow 1 - 4\sin^2 x \geq 0$

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



$D_f = \left[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6}\right]$ ✓

۹) الف) $y = \sqrt{1 - \log_{\frac{1}{2}}^{x-1}} \rightarrow 1 - \log_{\frac{1}{2}}^{x-1} \geq 0$

$1 \geq \log_{\frac{1}{2}}^{x-1}$

$\frac{1}{2} \leq x - 1 \rightarrow \frac{3}{2} \leq x \rightarrow D_f = [\frac{3}{2}, +\infty)$ ✓

۹) ب) $\frac{\sqrt{x^2 - x}}{1 - \log_4^{x^2-3x}}$ → ① $x^2 - x \geq 0$ → 0 | 1 | + | − | +

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

$x^2 - 3x - 4 \neq 0$

$x \neq 4$

$x \neq -1$

$D_f = (-\infty, 0] \cup [3, +\infty) - \{-1, 4\}$ ✓ ②

۱۰) الف) $y = \sqrt{2^{4x-x^2} - 8}$ → $2^{4x-x^2} - 8 \geq 0$

$2^{4x-x^2} \geq 8 \cdot 2^3$

$4x - x^2 \geq 3$

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

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

1 | 3 | + | − | +

$D_f = [1, 3]$ ✓ ②

۱۰) ب) $y = \left(\frac{3x+5}{2x+4}\right)!$ → $\frac{3x+5}{2x+4} \in W$

$D_f = \left\{x \mid x = \frac{3k-5}{2k-3}, k \in W\right\}$ ✓