سوال ۱)

$$2x^2+y^2-4x+6y+k=0 \to \underbrace{2x^2-4x+\bigcirc^{2}}_{2(x^2-2x+1)}+\underbrace{y^2+6y+\square^{9}}_{(y+3)^2}=0$$

$$2(x-1)^2$$

$$k=2+9=11$$

سوال ۲)

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

$$a^2+4a=2a+a+2 \to a^2+a-2=0 \to (a+2)(a-1)=0$$

$$\to a=-2,\ 1\ ;\ a>0$$

$$\Rightarrow f(1) \to x^2+4x \to 1+4(1)=5$$

سوال ۳) $a+b=?$

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

$$|x+1|\geq 2 \to x+1\geq 2 \to x\geq 1$$
$$\to x+1\leq -2 \quad x\leq -3$$

$$x=-3:\ 18-b=a-6 \to a+b=24$$

سوال ۴) اگر دامنه‌ی $\sqrt{b-3x}+\sqrt{6x-a}$ برابر $\{2\}$ باشد، $\frac{b}{a}=?$

$$6x-a\geq 0 \to a\leq 6x \to x\geq \frac{a}{6} \Rightarrow \frac{a}{6}=2 \Rightarrow a=12$$
$$b-3x\geq 0 \to 3x\leq b \to x\leq \frac{b}{3} \Rightarrow \frac{b}{3}=2 \Rightarrow b=6$$
$$\frac{6}{12},\ \frac{1}{2}$$

با سوال ۵ جابه‌جا نوشتم.

سوال ~~۵~~ ۶)

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

$$\to x=3^*,\ -2^*,\ 2,\ -3$$

$-3\quad -2^*\quad 2\quad 3^*$

$+\quad -\quad -\quad +\quad +$

$$\to D_f=(-\infty,-3)\cup(2,3)\cup(3,+\infty)$$

$x-1$ بخش پذیر

ب) $y=\sqrt{\dfrac{x^3-2x^2-5x+6}{x^3+2x^2-5x-6}}=\dfrac{(x-1)(x^2-x-6)}{(x+1)(x^2+x-6)}=\dfrac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}\geq 0$

$x+1$ بخش پذیر

$$x=1,\ 3,\ -2,\ -1,\ -3,\ 2$$

$-3\quad -2\quad -1\quad 1\quad 2\quad 3$

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

درسا صادق زاده - یازدهم ریاضی A

Subject: Year. Month. Day.

سوال ۱)

$2x^2+y^2-4x+6y+k=0 \to \underbrace{2x^2-4x+\overset{2}{\bigcirc}}_{2(x^2-2x+1)} + \underbrace{y^2+6y+\overset{9}{\square}}_{(y+3)^2}=0$

$2(x-1)^2$

$k=2+9=11$

سوال ۲)

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

$\to a^2+a-2=0 \to (a+2)(a-1)=0$

$\hookrightarrow a=-2, 1 ; a>0$

$\Rightarrow f(1) \rightsquigarrow x^2+4x \to 1+4(1)=5$

سوال ۳) $a+b=?$

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

$\overset{x=-3}{\Rightarrow}\ 18-b=a-6 \to a+b=24$

سوال ٤) اگر دامنه‌ی $y=\sqrt{6x-a}+\sqrt{b-3x}$ برابر $\{2\}$ باشد، $\frac{b}{a}=?$

$6x-a\geq 0 \to a\leq 6x \to x\geq \frac{a}{6} \Rightarrow \frac{a}{6}=2 \Rightarrow a=12$

$b-3x\geq 0 \to 3x\leq b \to x\leq \frac{b}{3} \Rightarrow \frac{b}{3}=2 \Rightarrow b=6$

$\frac{6}{12}=\frac{1}{2}$

با سوال ۵ جابه‌جا نوشتم.

سوال ~~۵~~ ۶)

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

$\to x=3^*, -2^*, 2, -3$

$\to D_f=(-\infty,-3)\cup(2,3)\cup(3,+\infty)$

$x=1$ ریشه

ب) $y=\sqrt{\dfrac{x^3-2x^2-5x+6}{x^3+2x^2-5x-6}}=\dfrac{(x-1)(x^2-x-6)}{(x+1)(x^2+x-6)}=\dfrac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}\geq 0$

$x=-1$ ریشه

$\hookrightarrow x=1, 3, -2, -1, -3, 2$

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

Subject: Year. Month. Day.

$\frac{x+1}{|x-3|} \geq 0 \longrightarrow x = -1, 3$ $\quad \frac{4-x}{x^2+2x+4} \geq 0 \rightarrow x \leq 4$ همیشه مثبت

سوال ۶.

الف) $y = \sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{4-x}{x^2+2x+4}}$ $\rightarrow$ ① ∩ ② $\rightarrow D_f = [-1, 4] - \{3\}$

$\rightarrow [-1,3) \cup (3, +\infty)$ ① $\qquad \rightarrow (-\infty, 4]$ ②

ب) $y = \sqrt{[x]-4} + \sqrt{2-[x]} \rightarrow 2-[x] \geq 0 \rightarrow [x] \leq 2 \rightarrow (-\infty, 3)$ ②

$[x]-4 \geq 0 \quad [x] \geq 4 \rightarrow x \in [4, +\infty)$ ① $\qquad$ ① ∩ ② $\rightarrow D_f = \varnothing$

سوال ۷.

د) $y = \sqrt{[-x]-2} \rightarrow [-x]-2 \geq 0 \quad [-x] \geq 2 \rightarrow D_f = (-\infty, -2)$

ه) $y = \frac{5x^2+4}{[x]^2-2[x]-3} \rightarrow [x]^2-2[x]-3 \geq 0 \rightarrow ([x]-3)([x]+1) \geq 0$

$[x]-3=0 \rightarrow [x]=3 \rightarrow x \in [3, 4)$, $[x]+1=0 \rightarrow [x]=-1 \rightarrow x \in [-1, 0)$

$\rightarrow D_f = R - [-1, 0) \cup [3, 4)$

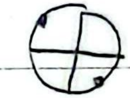
سوال ۸)

$y = \frac{\cot x + 1}{\tan x + 1} = \frac{\frac{\cos x}{\sin x}+1}{\frac{\sin x}{\cos x}+1} \longrightarrow \sin x \neq 0 \rightarrow$ $\quad \rightarrow \frac{\sin x}{\cos x} \neq -1 \rightarrow$ $\quad D_f = R - \{k\pi, k\pi - \frac{\pi}{4}\}$

سوال ۱۸)

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

$\frac{\cos x}{\sin x} + 1 \longrightarrow \sin x \neq 0 \rightarrow$ 

$\frac{\sin x}{\cos x} + 1 \rightarrow \frac{\sin x}{\cos x} \neq -1 \rightarrow$ 

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

$\hookrightarrow \cos x \neq 0 \rightarrow$ 

ادامه

$y = \sqrt{1 - 4\sin^2 x} \rightarrow 1 - 4\sin^2 x \geq 0 \rightarrow 4\sin^2 x \leq 1 \rightarrow \sin^2 x \leq \frac{1}{4} \rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$

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

سوال ۱۹) الف)

$y = \sqrt{1 - \log_{\frac{1}{2}}^{x-1}} \rightarrow 1 - \log_{\frac{1}{2}}^{x-1} \geq 0 \quad \log_{\frac{1}{2}}^{x-1} \leq 1 \rightarrow x - 1 \geq \frac{1}{2} \rightarrow x \geq \frac{3}{2}$

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

$\rightarrow D_f = [\frac{3}{2}, +\infty)$

ب) $y = \frac{\sqrt{x^2 - x}}{1 - \log_4^{x^2 - 3x}} \rightarrow 1 - \log_4^{x^2 - 3x} \neq 0 \quad \log_4^{x^2 - 3x} \neq 1 \rightarrow x(x-3) \neq 4$

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

$(x-4)(x+1) \neq 0$

$\rightarrow x \neq 4, -1$ ②

$\rightarrow x(x-1) \geq 0$

x		0		1	
	$+$	0	$-$	0	$+$

$\rightarrow x \in (-\infty, 0] \cup [1, +\infty)$ ①

$x^2 - 3x > 0$

$x(x-3) > 0$

x		0		3	
	$+$		$-$		$+$

$\leftarrow x \in (-\infty, 0) \cup (3, +\infty)$ ③

① ∩ ② ∩ ③ $= (-\infty, 0) \cup (3, +\infty) - \{4, -1\}$

سوال ۱۰) الف) $y=\sqrt{2^{4x-x^2}-8} \rightarrow 2^{4x-x^2}-2^3 \geq 0 \quad 2^{4x-x^2} \geq 2^3 \rightarrow -x^2+4x \geq 3$

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

$D_f = [1,3]$

ب) $y=\left(\dfrac{3x+5}{2x+4}\right)! \qquad \dfrac{3x+5}{2x+4} \in W \rightarrow 3x+5 \in 2xW+4W$

$3x-2xW \in 4W-5$

$x(3-2W) \in 4W-5$

$x \in \dfrac{4W-5}{3-2W}$

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