امیرحسین [illegible] یازدهم سه A

Year Month. Date. ( )

۱)

$2x^2+y^2-4x+4y+k=0 \xrightarrow{\Delta\geq 0} y^2+4y=\underbrace{-2x^2+4x}-k$

$-2x^2+4x=0 \rightarrow \Delta=b^2-4ac=16$

$\rightarrow 16\geq 0 \checkmark \Rightarrow -k=+4y \Rightarrow \boxed{k=-4y}$

$\xrightarrow{k=-4y} y^2+\cancel{4y}=-2x^2+4x-(\cancel{-4y}) \Rightarrow y^2=-2x^2+4x \Rightarrow \boxed{k=-4y}$

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۲)

$f(x)=\begin{cases} x^2+4x & ; x\geq a \\ 2x+a+2 & ; x<a \end{cases} \xrightarrow[\text{برابری}]{x=a} x^2+\cancel{4x}=\cancel{2x}+a+2 \Rightarrow x^2+2x-(a+2)=0$

$\xrightarrow{x=a} a^2+2a-(a+2)=0 \begin{cases} a=1 \\ a=-2 \end{cases} \xrightarrow[a>0]{\text{شرط}} \Rightarrow a=1$ صورت سوال

$\boxed{f(1)=(1)^2+4(1)=5}$

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۳)

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

$\Rightarrow 2x^2-b=a+2x \xrightarrow{x=-1} 2(-1)^2-b=a+2(-1) \Rightarrow 2-b=a-2 \Rightarrow \boxed{a+b=4}$

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۴)

$y=\sqrt{4x-a}+\sqrt{b-3x} \Rightarrow D_f \begin{cases} 4x-a\geq 0 \Rightarrow \boxed{4x\geq a} \; \mathrm{I} \\ b-3x\geq 0 \Rightarrow b\geq 3x \Rightarrow \boxed{4b\geq 4x} \; \mathrm{II} \end{cases}$

$\Rightarrow \mathrm{I}\cap\mathrm{II}=\{3\} \Rightarrow a=4b=12 \Rightarrow a=12, b=4 \rightarrow \boxed{\frac{b}{a}=\frac{1}{3}}$

$4x=4(3)=12$

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۵)

الف) $\sqrt{\frac{x+1}{|x|-3}}+\sqrt{\frac{4-x}{x^2+2x+2}}$

$\rightarrow \frac{4-x}{x^2+2x+2}\geq 0$ ($\Delta<0$) $\Rightarrow$ 4: $+ \; | \; -$ $\Rightarrow D_f=(-\infty,4]$ I

$\frac{x+1}{|x|-3}\geq 0 \Rightarrow$ -1, 3: $- \; | \; + \; | \; +$ $\Rightarrow D_f=[-1,+\infty)-\{3\}$ II

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

ب) $\sqrt{[x]-4}+\sqrt{2-[x]}$

$\rightarrow 2-[x]\geq 0 \Rightarrow 2\geq [x] \rightarrow [x]\leq 2$

$D_f=(-\infty,3)$ I

$[x]-4\geq 0 \Rightarrow [x]\geq 4 \rightarrow D_f: x\geq 4=[4,+\infty)$ II

$\boxed{D_f=\mathrm{I}\cap\mathrm{II}=\varnothing}$

Year. Month. Date. ( ) امیرحسین یزدخواستی یازدهم ر A

۶)

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

$3,-2$

$3,2,-2,-3$

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

$\Rightarrow \boxed{D_f=(-\infty,-3)\cup(-3,-2)\cup(2,3)\cup(3,+\infty)}$

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

$3,1,-2$

$2,-1,-3$

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

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

۷)

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

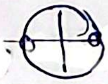
$\Rightarrow \boxed{D_f=(-\infty,-2]}$

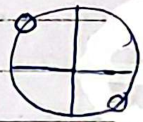
ب) $y=\dfrac{5x^3+6}{[x]^2-2[x]-3}$ همواره مثبت

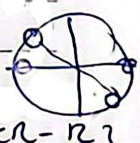
$[x]^2-2[x]-3 \rightarrow ([x]-3)([x]+1)$ $\begin{cases}[x]=3 \rightarrow 3\leq x<4\\ [x]=-1 \rightarrow -2<x\leq -1\end{cases}$

$\Rightarrow \boxed{D_f=[3,4)\cup[-2,-1)}$

۸)

الف) $y=\dfrac{\cot x+1}{\tan x+1}$ ، $\dfrac{\frac{\cos}{\sin x}+1}{\frac{\sin}{\cos}+1}$ → $\begin{cases}\sin x\neq 0\end{cases}$ → 

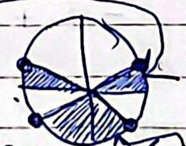
$\tan x+1\neq 0$ ، $\tan x\neq -1$ → 



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

ب) $y=\sqrt{1-4\sin^2x}$ ⇒ $1-4\sin^2x\geq 0$ ⇒ $1\geq 4\sin^2x$ ⇒ $\frac{1}{4}\geq \sin^2x$ ⇒ $\frac{1}{2}\geq \sin x$ ،

$\sin x\geq -\frac{1}{2}$



$\Rightarrow D_f=[2k\pi, 2k\pi+\frac{\pi}{6}]\cup[2k\pi+\frac{5\pi}{6}, k\pi]\cup[2k\pi+\frac{7\pi}{6}, 2k\pi-\frac{\pi}{6}]$

$\log_b^a = c \Rightarrow a = b^c \quad \begin{cases} a > 0 \\ b > 0 \\ b \neq 1 \end{cases}$

Year Month. Date ( )

امیرحسین یزدخواستی یازدهم ب A

۹)

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

$\boxed{x \geq \frac{3}{2} \Rightarrow D_f = (-\infty, \frac{3}{2}]}$

ب) $y = \dfrac{\sqrt{x^2 - x}}{1 - \log_4^{x^2 - 3x}} \longrightarrow x^2 - x \geq 0 \Rightarrow$

$0 \quad 1$

$+ \; | \; - \; | \; +$ $\rightarrow$ (I)

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

$\log_4^{x^2 - 3x} \neq 1 \Rightarrow x^2 - 3x \neq 4 \Rightarrow x^2 - 3x - 4 \neq 0 \rightarrow \mathbb{R} - \{4, -1\}$ (II)

$\boxed{\Rightarrow D_f = \text{I} \cap \text{II} = (-\infty, 0] \cup [1, +\infty) - \{-1, 4\}}$

۱۰)

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

$\Rightarrow 4x - x^2 \geq 3 \Rightarrow x^2 - 4x + 3 \leq 0 \rightarrow$

$1 \quad 3$

$+ \; | \; - \; | \; +$ $\Rightarrow \boxed{D_f = [1, 3]}$

ب) $\left(\dfrac{3x + 5}{2x + 4}\right)! \longrightarrow \dfrac{3x + 5}{2x + 4} \in W \Rightarrow 2Wx + 4W = 3x + 5$

$\Rightarrow 2Wx - 3x = 5 - 4W$

$\Rightarrow x(2W - 3) = 5 - 4W \Rightarrow x = \dfrac{5 - 4W}{2W - 3}$

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