ریانا عابدی — تکلیف شماره ۳ — یازدهم دختر A

**۱)** الف) $y=\dfrac{x+3}{2x^3+3x^2-8x+3}=\dfrac{(x+3)}{(x-1)(2x^2+5x-3)}=\dfrac{\cancel{(x+3)}}{(x-1)(x-\frac{1}{2})\cancel{(x+3)}}$

$=\dfrac{1}{(x-1)(x-\frac{1}{2})}\neq 0 \rightarrow D=R-\{1,\frac{1}{2},-3\}$

ب) $y=\dfrac{x+3}{2x^3+9x^2+10x+3}=\dfrac{x+3}{(x+1)(2x^2+7x+3)}=\dfrac{\cancel{x+3}}{(x+1)(x+\frac{1}{2})\cancel{(x+3)}}\neq 0$

$D=R-\{-1,-\frac{1}{2},-3\}$

**۲)** الف) $y=\dfrac{x+3}{x^3-2x^2+2x-1} \rightarrow (x-1)\underbrace{(x^2-x+1)}_{\Delta<0}=0 \rightarrow D=R-\{1\}$

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

$x^3-2x^2+2x-1=0 \rightarrow (x-1)\underbrace{(x^2-x+1)}_{\text{همواره مثبت}}=0$

$x=1$

| | $-3$ | | $1$ | |
|---|---|---|---|---|
| $+$ | | $-$ | ق | $+$ |

$D=(-\infty,-3]\cup(1,+\infty)$

**۳)** $y=\dfrac{2}{x^2-5|x-1|-2x+5}$ $\quad |x-1|=\begin{cases}x-1 & x\geq 1\\ -(x-1) & x<1\end{cases}$

$x\geq 1 \rightarrow x^2-5|x-1|-2x+5=x^2-5(x-1)-2x+5=x^2-7x+10=0 \rightarrow$

$(x-2)(x-5)=0 \rightarrow x\neq 2,5$

$x<1 \rightarrow x^2+5(x-1)-2x+5=x^2+3x=0 \rightarrow x(x+3)=0 \rightarrow x\neq 0,3$

$D=R-\{0,2,3,5)$

**۴)** الف) $y=\dfrac{x+3}{|2x+1|-|x+3|}$ $\quad |2x+1|-|x+3|=0 \rightarrow |2x+1|=\underbrace{|x+3|}_{\geq 0}$

$2x+1=\pm(x+3) \rightarrow \begin{cases}2x+1=x+3 \Rightarrow x=2\\ 2x+1=-\underbrace{(x+3)}_{-x-3} \Rightarrow 3x=-4 \rightarrow x=\frac{-4}{3}\end{cases}\Bigg\}\ D=R-\{-\frac{4}{3},2\}$

ب) $y=\sqrt{|2x+1|-|x+3|}\geq 0 \rightarrow |2x+1|\geq\underbrace{|x+3|}_{\geq 0} \rightarrow$

$\begin{cases}2x+1\geq x+3 \rightarrow x\geq 2\\ \text{یا}\\ 2x+1\leq -\underbrace{(x+3)}_{-x-3} \Rightarrow 3x\leq -4 \rightarrow x\leq -\frac{4}{3}\end{cases} \rightarrow D=(-\infty,-\frac{4}{3}]\cup[2,+\infty)$

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۵)

الف) $y=\log_{2}(1-\log_{3}^{x}) \rightarrow \begin{cases} 1-\log_{3}^{x}>0 \rightarrow \log_{3}^{x}<1 \rightarrow x<3 \\ x>0 \\ 2>0 \\ 2\neq 1 \end{cases}$

$D=(0,3)$

ب) $y=\log_{2}(1-\log_{\frac{1}{2}}^{x}) \rightarrow \begin{cases} 1-\log_{\frac{1}{2}}^{x}>0 \rightarrow \log_{\frac{1}{2}}^{x}<1 \rightarrow x>1/2 \ , x>0 \\ 2\neq 0 \\ 2>0 \end{cases}$

$D=(1/2,+\infty)$

۶)

$f(x)=\sqrt{\log_{0.5}\log_{5}^{(2x-1)}}\geq 0 \xrightarrow{①} \log_{5}^{2x-1}\leq 1 \rightarrow 2x-1\leq 5 \rightarrow x\leq 3$

② $\log_{5}^{2x-1}\geq 0 \rightarrow 2x-1\geq 1 \rightarrow 2x\geq 2 \rightarrow x\geq 1$

③ $2x-1>0 \rightarrow 2x>1 \rightarrow x>\frac{1}{2}$

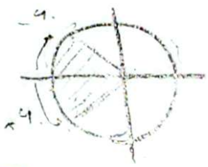
$D=[1,3]$

۷)

الف) $y=\log_{10}(2\cos x+1) \rightarrow 2\cos x+1>0 \rightarrow 2\cos x>-1$

$\cos x>-\frac{1}{2}$

$\cos x=-\frac{1}{2} \rightarrow x=$



$2k\pi-\frac{2\pi}{3}<x<2k\pi+\frac{2\pi}{3}$

ب) $y=\sqrt{\log\frac{x-1}{x+1}}\geq 0 \rightarrow \frac{x-1}{x+1}\geq 1 \rightarrow \frac{x-1}{x+1}-1\geq 0 \rightarrow$

$\frac{x-1-(x+1)}{x+1}=\frac{\cancel{x}-1-\cancel{x}-1}{x+1}=\frac{-2}{x+1}\geq 0 \Rightarrow x+1<0 \rightarrow x<-1 \rightarrow (-\infty,-1)$

۸)

$f(x)=\sqrt{(a+2)x^2+ax+b}\geq 0$

چون دامنه‌ی عبارت زیر رادیکال $(-\infty,3]$ است پس دهانه‌ی سهمی رو به پایین و $a+2\leq 0$ است بیشترین مقدار در $x=3$ اتفاق می‌افتد

$\rightarrow (a+2)x^2+ax+b=(a+2)(x-3)^2$

$(a+2)x^2+ax+b=(a+2)x^2-6(a+2)x+9(a+2) \rightarrow$

$-6a-12=a \rightarrow a=-\frac{12}{7}\neq -2$ غ ق ق $\rightarrow a+2=0 \rightarrow a=-2$

عبارت زیر رادیکال خطی است

$ax+b\geq 0 \rightarrow -2x+b\geq 0 \rightarrow -2x\geq -b \Rightarrow$

$x\leq\frac{b}{2} \xrightarrow{D} (-\infty,\frac{b}{2}] \rightarrow \frac{b}{2}=+3 \Rightarrow b=6$

۹)

$f(x)=\sqrt{x^2+2x+\underbrace{2}_{1+1}-m^2}\geq 0 \rightarrow (x^2+2x+1)+(1-m^2)\geq 0 \rightarrow$

$\underbrace{(x+1)^2}_{\geq 0}+(1-m^2)\geq 0 \rightarrow 1-m^2\geq 0 \rightarrow \sqrt{m^2}\leq\sqrt{1} \rightarrow |m|\leq 1 \rightarrow -1\leq m\leq 1$

$1-(-1)=2$

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۱۰)

$f(x) = \dfrac{\sqrt{4-x^2}}{[x]+[-x]+1}$ $\quad \sqrt{4-x^2} \geq 0 \rightarrow \sqrt{x^2} \leq \sqrt{4} \rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2$

$[x]+[-x]+1 \neq 0 \rightarrow [x]+[-x] \neq -1 \rightarrow [x]+[-x] = 0 \rightarrow x \in \mathbb{Z}$

$[x]+[-x] = \begin{cases} 0 & x \in \mathbb{Z} \\ -1 & x \notin \mathbb{Z} \end{cases}$ $\qquad \mathbb{Z} \cap [-2, 2] = [-2, 2]$

$\{-2, -1, 0, 1, 2\}$

۵ عدد صحیح