۱۸,۷۵

نام و نام خانوادگی ......پریم..ایلیان........... پاسخنامه تشریحی تکلیف شماره ..4... کلاس ....A..........

۱

الف) $F(x)=\sqrt{\frac{x-1}{x}-\frac{x}{x-1}} \rightarrow \frac{x-1}{x}-\frac{x}{x-1}\geq 0 \rightarrow \frac{(x-1)(x-1)-(x)(x)}{x(x-1)} \rightarrow \frac{x^2+1+2x-x^2}{x(x-1)} = \frac{1+2x}{x(x-1)} \rightarrow x \geq \frac{-1}{2},\ x=0,\ x=1$

$-2x+1$

$\rightarrow [-\frac{1}{2},0)\cup(1,+\infty)$

$Df:(-\infty,0)\cup[\frac{1}{2},1)$

۱,۵

ب) $F(x)=\frac{1}{\boxed{x+1}}-\frac{2}{x}$ تابع صفر باشد $x+1=0 \Rightarrow x=-1$, $\boxed{x=0}$ $\rightarrow R-\{-1,0,-\frac{5}{4},1,-2\}$

$\rightarrow \frac{3}{x-1}+\frac{1}{x+2}\geq 0 \rightarrow \frac{3(x+2)+1(x-1)}{(x-1)(x+2)} = \frac{3x+6+x-1}{(x-1)(x+2)} \rightarrow 4x+5 \Rightarrow x=\frac{-5}{4}$, $x=1,-2$

۲

الف) $F(x)=\sqrt{\left((\frac{1}{3})^x-9\right)(32-4^x)} \rightarrow \frac{1}{3}^x-9\geq 0 \rightarrow \frac{1}{3}^x\geq 9 \rightarrow \frac{1}{3}^x=9 \rightarrow x=-2$

$\rightarrow 32-4^x\geq 0 \rightarrow -4^x\geq -32 \rightarrow 4^x\leq 32 \rightarrow (2^2)^x=2^5=32 \rightarrow \frac{5}{2}$

$\rightarrow (-\infty,-2]\cup[\frac{5}{2},+\infty)$

۱,۵

ب) $\sqrt[4]{x-1}+\sqrt{y+1}=3 \rightarrow x-1\geq 0 \rightarrow x\geq 1$
$\rightarrow y+1\geq 0 \rightarrow y\geq -1$ $\rightarrow [x\geq 1, y\geq -1 \mid (x,y)\in R]$

۳

$F(x)=\frac{\log_4(x^2-x-2)}{\sqrt{x^2-1}+1} \rightarrow x^2-x-2>0 \rightarrow (x-2)(x+1) \rightarrow x=-1,2$

$\rightarrow x^2-1\geq 0 \rightarrow x^2\geq 1 \rightarrow x=\pm 1$

۵

$\rightarrow (-\infty,-1)\cup(2,+\infty)$

۴

$\sqrt{3+ax-x^2} \rightarrow 3+ax-x^2\geq 0 \rightarrow x^2-ax-3\leq 0 \rightarrow x^2-ax-3=0$

$\rightarrow x=\frac{a\pm\sqrt{\Delta}}{2}$ $\xrightarrow{x_1=-2,\ x_2=b}$ $-2=\frac{a-\sqrt{a^2+12}}{2}$, $b=\frac{a+\sqrt{a^2+12}}{2}$ $\rightarrow \frac{-\frac{1}{2}+\sqrt{\frac{1}{4}+12}}{2}=\frac{3}{2}$

۵

$\rightarrow -2=\frac{a-\sqrt{a^2+12}}{2} \rightarrow -4=a-\sqrt{a^2+12} \rightarrow \sqrt{a^2+12}=a+4 \xrightarrow{\text{به توان ۲}} a^2+12=(a+4)^2 = a^2+8a+16$

a^2 حذف $\rightarrow 12=8a+16 \rightarrow 8a=-4 \rightarrow \boxed{a=-\frac{1}{2}}$, $\boxed{b=\frac{3}{2}}$ $\rightarrow -\frac{1}{2}+\frac{3}{2}=1$

۵

$F(x)=\begin{cases}3x-2 & : x\geq 1\\ 2x+3 & : x<1\end{cases} \rightarrow g(x)=\sqrt{F(x)-x} \rightarrow F(x)-x\geq 0 \rightarrow 3x-2-x\geq 0,\ 2x+3-x\geq 0$

$\rightarrow x+3\geq 0 \rightarrow x\geq -3$

۵

$\rightarrow [-3,+\infty)$

$\rightarrow 2x-2\geq 0 \rightarrow 2x\geq 2 \rightarrow x\geq 1$

$f(x)=\begin{cases}(a+1)(x+2) & : x>1\\ 3a+2x & : x\leq 1\end{cases} \rightarrow 2f(5)=f(-2)+9$ $\rightarrow 2(a+1)(\overset{7}{\cancel{5+2}})=3a-4+9$ $2a+2(7)=14a+14=4a-4 \rightarrow 10a=-18 \rightarrow a=-\frac{18}{10}$ $\longrightarrow \boxed{a=-1,8}$	۶
$f(x)=\sqrt{x}+\frac{1}{\sqrt{x}}+2 \rightarrow \underbrace{f(2-\sqrt{3})}_{a}+\underbrace{f(2+\sqrt{3})}_{b}$ $\underbrace{\sqrt{2-\sqrt{3}}+\frac{1}{\sqrt{2-\sqrt{3}}}+2+\sqrt{2+\sqrt{3}}}+\frac{1}{\sqrt{2+\sqrt{3}}}+2$ $4+\sqrt{6}+\frac{a+b}{ab}=4+\sqrt{6}+\sqrt{6} \rightarrow 4+2\sqrt{6}$	۷
$2f(x)-3f(-x)=4x^2-x \rightarrow f(x)=ax^2+bx+c \rightarrow f(-x)=a(-x)^2+b(-x)+c=ax^2-bx+c$ $\rightarrow 2f(x)-3f(-x)=\underbrace{2(ax^2+bx+c)}-\underbrace{3(ax^2-bx+c)}$ $(2ax^2+2bx+2c)+(-3ax^2+3bx-3c)=(2a-3a)x^2+(2b+3b)x+(2c-3c)$ $\rightarrow ax^2+5bx-c \rightarrow ax^2+5bx-c=4x^2-x$ $\rightarrow -a=4 \rightarrow a=-4x^2 \;,\; 5b=-1 \rightarrow b=-\frac{1}{5}x \;,\; -c=0 \rightarrow \underline{c=0}$ $\longrightarrow \underline{f(x)=-4x^2-\frac{1}{5}x}$	۸
$(x+2)f(x)-3xf(x+2)=4x^2-mx+3m-1$ $f(0) \rightarrow 2f(0)=3m-1 \longrightarrow f(0)=\frac{3m-1}{2}$ $f(-2) \longrightarrow 6f(0)=16+2m+3m-1 \rightarrow f(0)=\frac{15+5m}{6}$ $\frac{3m-1}{2}=\frac{15+5m}{6} \rightarrow 18m-6=30+10m \rightarrow 8m=36 \rightarrow m=\frac{9}{2}$ $\longrightarrow f(0)=\frac{3(\frac{9}{2})-1}{2}=\frac{\frac{27}{2}-\frac{2}{2}}{2}=\frac{\frac{25}{2}}{2}=\frac{25}{4}$	۹
$f(x)+f(\frac{1}{x})=\frac{3x^2-12x+3}{x} \longrightarrow f(-1)+f(-1)=\frac{\overset{3}{\cancel{3(1)}}+\overset{12}{\cancel{-12(-1)}}+3}{-1}=\frac{18}{-1}=-18$ $\longrightarrow 2f(-1)=-18 \rightarrow f(-1)=-\frac{18}{2} \longrightarrow \boxed{f(-1)=-9}$	۱۰

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

$\underbrace{3-\sqrt[4]{x-1}}_{\geq 0}=\sqrt{y+1} \;\; + \;\; \rightarrow x\leq 82 \;\; D_f=[1,82]$

(― ۲