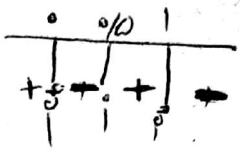
نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ... کلاس ...

19,5

۱ (۲)

$$f(x)=\sqrt{\frac{x-1}{x}-\frac{x}{x-1}}=\sqrt{\frac{x^2-2x+1-x^2}{x^2-x}}$$



$$\mathbb{R}-[0,0/0)\cup[1,+\infty)$$ ✓

۲ (۱,۷۵)

$$f(x)=\frac{\frac{1}{x+1}-\frac{2}{x}}{\frac{3}{x-1}+\frac{1}{x+2}}$$

$$D_f=\mathbb{R}-\{1,0,-1,-2,\frac{-5}{4}\}$$ ✓

$\frac{3}{x-1}+\frac{1}{x+2}\neq 0$

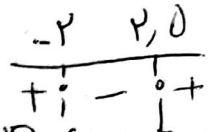
$3x+4+x-1\neq 0 \Rightarrow x\neq -\frac{4}{5}$

۲

$$f(x)=\sqrt{\left(\left(\frac{1}{3}\right)^x-9\right)\left(3^{x+2}-4^x\right)}$$

$\left(\frac{1}{3}\right)^x-9=0 \rightarrow x=-2$

$3^{x+2}-4^x=0 \rightarrow x=2,0$



$D_f=\mathbb{R}-(-2,2,0)$ ✓

۳ (۲)

$$\sqrt[4]{x-1}+\sqrt{y+1}=3$$ همواره مثبت

$$\left.\begin{array}{l}\sqrt[4]{x-1}\leq 3\\ x-1\geq 0\end{array}\right\}\Rightarrow 1\leq x\leq 17$$ ✓

۳

$$f(x)=\frac{\log_4(x^2-x-2)}{\sqrt{x^2-1}+1}$$ همواره مثبت

$x^2-1\geq 0 \rightarrow x\leq -1$ یا $x\geq 1$

$x^2-x-2>0 \rightarrow (x+1)(x-2)>0$

$x<-1$ یا $x>2$

$\Rightarrow x\leq -1$ یا $x\geq 2$ ✓

۴ (۲)

$$-(x+2)(x-b)=2b+(b-2)x-x^2=3+ax-x^2 \Rightarrow b=1,5$$ ✓

$a=-0/5$

$a+b=1$ ✓

۵ (۲)

$$f(x)=\begin{cases}3x-2, & x\geq 1\\ 2x+3, & x<1\end{cases}$$

$f(x)-x\geq 0$

$x\geq 1$: $3x-2-x\geq 0$ همواره صحیح

$x<1$: $2x+3\geq 0 \Rightarrow x\geq -3$

$\Rightarrow x\geq -3$ ✓

۶ (۲)

$$f(x)=\begin{cases}(a+1)(x+2), & x>1\\ 2a+2x, & x\le 1\end{cases} \qquad 2f(0)=f(-2)+a \qquad a=?$$

$$2(2a+2)=2a-4+a \Rightarrow 10a=-18 \quad a=-\frac{9}{5}$$ ✓

۷ (۲)

$$f(x)=\sqrt{x}+\frac{1}{\sqrt{x}}+2$$

$$f(2-\sqrt{2})+f(2+\sqrt{2})=\left(\sqrt{2-\sqrt{2}}+\frac{1}{\sqrt{2-\sqrt{2}}}+\sqrt{2+\sqrt{2}}+\frac{1}{\sqrt{2+\sqrt{2}}}+4\right)\times\underbrace{\sqrt{2-\sqrt{2}}\times\sqrt{2+\sqrt{2}}}_{1}=$$

$$\sqrt{2-\sqrt{2}}+\sqrt{2+\sqrt{2}}+\sqrt{2+\sqrt{2}}+\sqrt{2-\sqrt{2}}+4=\frac{\sqrt{8+2\sqrt{12}}}{(\sqrt{6}+\sqrt{2})^2}+\frac{\sqrt{8-2\sqrt{12}}}{(\sqrt{6}-\sqrt{2})^2}+4=2\sqrt{2+4}$$ ✓

۸ (۱٫۷۵)

$$\left.\begin{aligned}2\times\ 2f(x)-4f(-x)&=4x^2-8x\\ 2\times\ 2f(-x)-4f(x)&=4x^2+8x\end{aligned}\right\}\ -6f(x)=-16x^2+16x$$

$$f(x)=\frac{8}{3}x^2-\frac{8}{3}x$$ ✓

۹ (۴)

$$x=0 \rightarrow 2f(0)-3\times 0\times f(2)=3m-1$$

$$2f(0)=3m-1$$

$$x=-2 \qquad +4f(f(0))=14+2m+3m-1$$

$$\Rightarrow \begin{cases}5m+10=4m-2\\ m=-4,0\end{cases} \Rightarrow f(0)=4,20$$ ✓

۱۰ (۴)

$$f(-1) \rightarrow f(-1)+f(-1)=\frac{2+12+2}{-1}$$

$$2f(-1)=-18$$

$$f(-1)=-9$$ ✓