نام و نام خانوادگی نیلا انصاری — تکلیف شماره ۷ — کلاس پسر A

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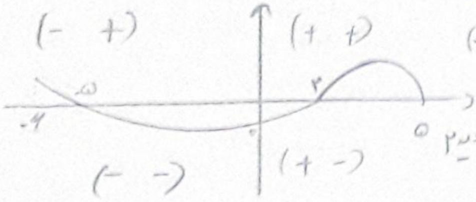
$y=\sqrt{xf(x)}$ $\qquad xf(x)\geqslant 0 \longrightarrow D_f=[-5,0]\cup[2,5]$

-6		-5		0		2		5
	$-$		$+$		$-$		$+$	
	$(-\times+)$		$(-\times-)$		$(+\times-)$		$(+\times+)$	
	ناحیه ۲		ناحیه ۳		ناحیه ۴		ناحیه ۱	



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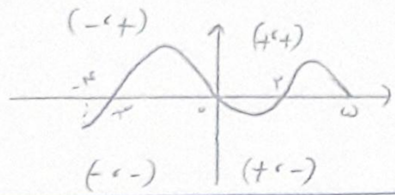
$y=\sqrt{\frac{-x}{f(x)}} \Rightarrow \frac{-x}{f(x)}\geqslant 0 \Rightarrow D_f=(-3,2)-\{0\}$

$f(x)\neq 0$



-4		-3		0		2		5
	$-$		$+$		$+$		$-$	

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$f(x)-2f(2)=x^2-3x+4$

$f(2)-2f(2)=2^2-3(2)+4 \Rightarrow -f(2)=2 \Rightarrow f(2)=-2$

$\Rightarrow f(-2)-2(-2)=(-2)^2-3(-2)+4 \Rightarrow f(-2)+4=4+6+4 \Rightarrow f(-2)=4+6+4-4=\boxed{10}$

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$f(f(5))+f(f(1)) \Rightarrow f(2)+f(5)=\boxed{9}$

$f(x)\begin{cases} x-\sqrt{x+4} & ; x>3 \\ 2x+3 & ; x\leqslant 3\end{cases}$ $\qquad f(5)=5-\sqrt{5+4}=5-\sqrt{9}=5-3=2$

$f(1)=2(1)+3=5 \qquad f(2)=2(2)+3=7$

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$f(x-1)-f(x)=6x+2$

$f(x)=ax^2-bx+2 \Rightarrow f(0)=2$

$f(x-1)-f(x)=6x+2 \Rightarrow f(0)-f(1)=6x+2 \Rightarrow 2-f(1)=6x+2 \Rightarrow f(1)=-6x=-6$

$\left.\begin{array}{l} f(x)=ax^2-bx+2 \Rightarrow f(1)=a-b+2 \\ f(1)=-6 \end{array}\right\} \Rightarrow a-b+2=-6 \Rightarrow \boxed{a-b=-8}$

$$f(x)=\frac{x^2+4x+5}{x^2+4x+7}=\frac{x^2+4x+4+1}{x^2+4x+4+3}=\frac{(x+2)^2+1}{(x+2)^2+3}\Rightarrow\frac{(\sqrt{3}-2+2)^2+1}{(\sqrt{3}-2+2)^2+3}=\frac{3+1}{3+3}=\frac{4}{6}=\boxed{\frac{2}{3}}$$

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

$$\Rightarrow f(-3)=(-3)^2+2=\boxed{11}$$

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$g(x)=\sqrt{9-x^2}$ $\qquad f(x)=\{(2,0),(1,-4),(0,2),(7,1)\}$

الف) $\frac{f}{g}=\left\{\left(0,\frac{2}{3}\right),\left(1,\frac{-4}{\sqrt{8}}\right),\left(2,\frac{0}{\sqrt{5}}\right)\right\}$

ب) $\frac{g}{f}=\left\{\left(0,\frac{3}{2}\right),\left(1,\frac{\sqrt{8}}{-4}\right)\right\}$

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$f(x)=\{(1,-2),(2,1),(3,4),(-5,2)\}$

الف) $2f(x)=\{(1,-4),(2,2),(3,8),(-5,4)\}$ $\qquad$ ب) $f(x)+1=\{(1,-1),(2,2),(3,5),(-5,3)\}$

ج) $3f^2(x)+1=\{(1,13),(2,4),(3,49),(-5,13)\}$ $\qquad$ د) $f(2x)=\left\{\left(\frac{1}{2},-2\right),(1,1),\left(\frac{3}{2},4\right),\left(-\frac{5}{2},2\right)\right\}$

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الف) $f-g=\{(1,4),(2,2),(3,2)\}$

ب) $\frac{2f}{g}=\left\{\cancel{\left(1,\frac{4}{0}\right)},\left(2,\frac{6}{1}\right),\left(3,\frac{2}{-1}\right)\right\}=\{(2,6),(3,-2)\}$

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