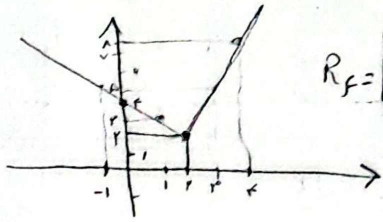
پارمیس عباسیان   تکلیف شماره ۷   یازدهم ریاضی

۱) الف) $x+|2x-4|$ ، $x=2$ $\longrightarrow$

$x<2$	$x>2$
$x-2x+4$	$x+2x-4$
$-x+4$	$3x-4$



$R_f=[2,+\infty)$

ب) $=|x-2|+|x-1|-|x|=$ ؛ 2 ، 1 ، 0

$0 \to 2+1$

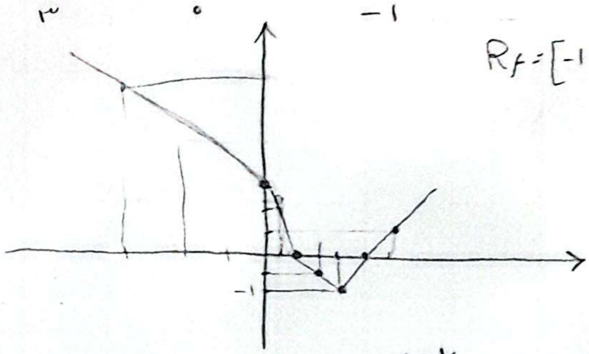
$1 \to 1+0-1$

$2 \to 0+1-2=-1$

$x<0$	$0<x<1$	$1<x<2$	$x>2$
$-x+2-x+1+x$	$-3x+3$	$-x+2+x-1-x$	$x-2+x-1-x$
$-x+3$		$-x+1$	$x-3$
3	0	-1	

$-\frac{3}{2}+3 \Rightarrow -1\frac{1}{2}+3=2\frac{1}{2}$

$-3\times\frac{1}{3}=-1$



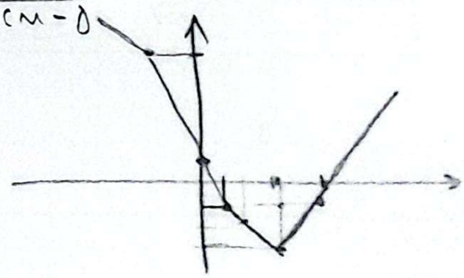
$R_f=[-1,+\infty)$

۲) $|3x-3|-|x+2|=k$ ؛ 1 ، -2

$k=2 \to y=k$ یک ریشه

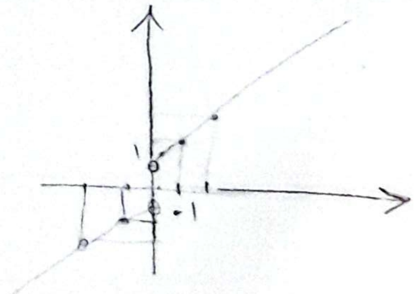
$x<-2$	$-2<x<1$	$x>1$
$-2x+5$	$-4x+1$	$2x-5$

$y=k$



۳) الف) $=y=x+\frac{x}{|x|}$

$x>0$ ، $x<0$ $\begin{cases} x+1 & , x>0 \\ x-1 & , x<0 \end{cases}$

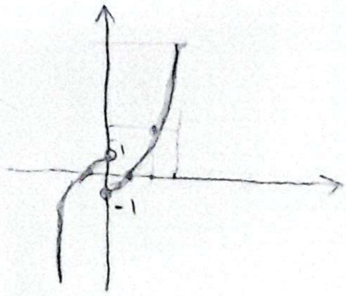


ب) $=y=x|x|-\frac{x}{|x|}$

$x>0 \longrightarrow x^2-1$

$x<0 \longrightarrow -x^2+1$

$\begin{cases} x^2-1 & , x>0 \\ -x^2+1 & , x<0 \end{cases}$

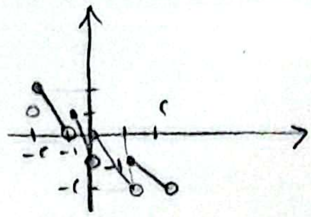


$[-2,2]$

۴) الف) $[x]-2x$

$[-2]-2(-2)=-2+4=2$

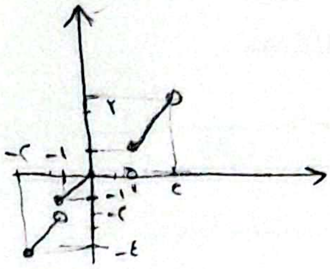
$[2]-4=-2$



ب) $[x]|x|$

$[-2]|-2|=-2\times 2=-4$

$[2]|2|=4$



۵) $0\leq x-[x]<1$

الف) $3x-[3x]$ $[0,1)$

ب) $4x-4[x]$ $0\leq 4(x-[x])<4$ $R=[0,4)$

ج) $x-5[\frac{x}{5}]$ $0\leq \frac{x}{5}-[\frac{x}{5}]<1 \rightarrow \frac{y}{5}=[0,1) \xrightarrow{\times 5} [0,5)$

د) $[2x]-2x \xrightarrow{\times(-1)} -y=2x-[2x] \rightarrow (-1,0]$

۶) $-\sqrt{a^2+b^2}\leq a\sin x+b\cos x\leq\sqrt{a^2+b^2}$

الف) $y=3\sin x+2\cos x$ $\quad R_f=[-\sqrt{13},\sqrt{13}]$

$-\sqrt{9+4}\leq 3\sin x+2\cos x\leq\sqrt{9+4}$

ب) $y=4\sin x-3\cos x$ $\quad -\sqrt{16+9}\leq 4\sin x-3\cos x\leq\sqrt{16+9}$ $R_f=[-5,5]$

ج) $y=[2\sin x+5\cos x]$ $-\sqrt{4+25}\leq[2\sin x+5\cos x]\leq\sqrt{4+25}$

$[-\sqrt{29}]\leq \bigcirc \leq[\sqrt{29}] \rightarrow R_f[-6,5]$

$[-5,5]$ $\quad [5,5]$

د) $y=\sqrt{\cos x-2\sin x}$

$-\sqrt{4+1}\leq\cos x-2\sin x\leq\sqrt{4+1}$ $\quad \mathbb{R}\ \sqrt{[-\sqrt{5},\sqrt{5}]}=[0,\sqrt{5}]$

۷) الف) $\sin^2 x + 3\sin x + 2$ $\xrightarrow{1}$ $1+3+2=6$ $\quad R_f = [0, 6]$

$\xrightarrow{-1}$ $1-3+2=0$

$\frac{-b}{2a}$ $-\frac{3}{2}$ α

ب) $2\sin^2 x + 3\sin x + 2$

$Max^{(1)} = 2+3+2=7$

$Min^{(-1)} = 2-3+2=1$

$\frac{-b}{2a} \Rightarrow -\frac{3}{4} \longrightarrow y = \frac{7}{8}$ $\quad [\frac{7}{8}, 7]$

۸) الف) $\sin^2 x + 4\cos^2 x$ $\quad \underbrace{\sin^2 x + \cos^2 x}_{1} + 3\cos^2 x = 1 + \underbrace{3\cos^2 x}_{[0, 3]} \longrightarrow [1, 4]$

ب) $y = \frac{2\cot x}{1+\cot^2 x} \rightarrow \frac{\sin^2 + \cos^2}{\sin^2} = \frac{1}{\sin^2 x}$ $\quad \frac{\frac{2\cos}{\sin}}{\frac{1}{\sin^2 x}\ \sin x} = 2\sin x\cos x = \sin 2x \to [-1, 1]$

($\cot^2 \to \frac{\cos^2}{\sin^2}$)

۹) الف) $y = \sin^4 x + \cos^4 x$ $\quad (2k \to 4)$

$2^{1-k} \leq \sin^{2k} + \cos^{2k} \leq 1$

$2^{1-2} \leq \sin^4 x + \cos^4 x \leq 1 \rightarrow 2^{-1} \leq \quad \leq 1$

$R_f = [\frac{1}{2}, 1]$

ب) $y = [\sin^8 x + \cos^8 x]$ $\quad (2k \to 8)$

$2^{1-k} \leq \sin^{2k} + \cos^{2k} \leq 1$

$2^{1-4} \leq \sin^8 + \cos^8 \leq 1$ $\quad [\frac{1}{8}, 1] \xrightarrow{[\ ]} R_f = [0, 1]$

$2^{-3} = \frac{1}{8}$

۱۰) الف) $\frac{2x^2 + 7x - 4}{x+4}$ $\quad \frac{(2x-1)(x+4)}{x+4} = 2x - 1$ $\quad \mathbb{R} - \{-4\}$

ب) $y = \frac{x^3 - 1}{x - 1}$ $\quad \frac{(x-1)(x^2-x+1)}{(x-1)}$ $\quad x^2 - x + 1 \nearrow \frac{-b}{2a} = \frac{1}{2}$

$y = \frac{3}{4}$

$R_f = [\frac{3}{4}, +\infty) - \{1\}$