ایلیار کریم زاده - یازدهم ریاضی B - نطبیه ۲۰

۱-

$\frac{1}{x-1} = |x-1| \begin{cases} \xrightarrow{x>1} 1 = x^2-2x+1 \to x^2-2x=0 \to \begin{cases} x=0 & 0<1 \text{ غ ق ق} \\ \boxed{x=2} & \text{ق ق} \end{cases} \\ 1 = -x^2+2x-1 \to x^2-2x+2=0 \quad \Delta<0 \end{cases}$

۲-

الف - $\left(\left|\frac{2x-1}{x}\right|<2\right)^2 \to \frac{4x^2-4x+1}{x^2}-4<0 \to \frac{4x-1}{x^2}>0$

x		0		$\frac{1}{4}$	
	$+$		$-$		$+$

$\to R = \ ,+\infty)$

ب - $\left(\left|\frac{x-2}{2x+1}\right|>1\right)^2 \to \frac{x^2-4x+4}{4x^2+4x+1}-1>0 \to \frac{-3x^2-8x+3}{4x^2+4x+1}>0 \to \frac{-(3x-1)(x+3)}{(2x+1)^2}>0$

-3		$\frac{1}{3}$
$-$	$+$	$-$

$\llcorner x \neq -\frac{1}{2} \longrightarrow D = (-3, -\frac{1}{2}) \cup (-\frac{1}{2}, \frac{1}{3})$

۳-

$x^2<|x+6| \xrightarrow{x\geq -6} x^2-x-6<0 \to (x-3)(x+2)<0$

-2		3
$+$	$-$	$+$

$\to \frac{-2+3}{2}=\frac{1}{2} \quad -2-\frac{1}{2}<x-\frac{1}{2}<3-\frac{1}{2}$

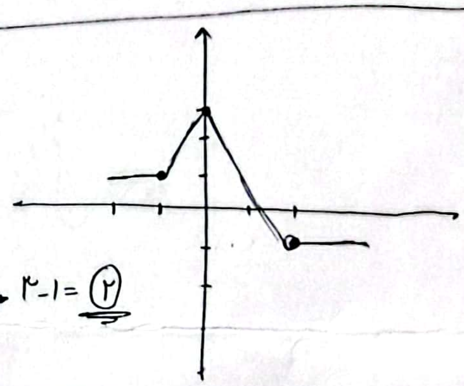
$\llcorner x<-6 \quad x^2+x+6>0 \to \Delta<0$

$\llcorner |x-\frac{1}{2}|<\frac{5}{2} \quad \boxed{\alpha=-\frac{1}{2}}$

۴-

$y=|x+1|-|2x|+|x-2|$

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

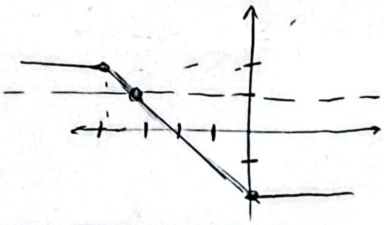


$min=-1 \quad max=3 \to 3-1=2$

۵-

$y=|\frac{1}{2}x|-2 \to |\frac{1}{2}(x+4)|-1 = |\frac{1}{2}x+2|-1$

$|\frac{1}{2}x|-2=|\frac{1}{2}x+2|-1 \to |\frac{1}{2}x|-1=|\frac{1}{2}x+2|$



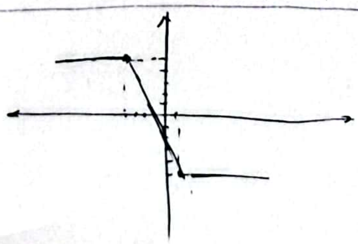
$\hookrightarrow |\frac{1}{2}x|-|\frac{1}{2}x+2|=1$

	-4		0	
2		$-x-2$		-2

$-x-2=1 \to \boxed{x=-3}$

۶-

الف) $f(x)=[|1-x|-|x+4|]$



$R_f=\{0, \pm1, \pm2, \pm3, \pm4, \pm5\}$

ب) $f(x)=\frac{1}{x}-[1+\frac{1}{x}] = \underbrace{\frac{1}{x}-[\frac{1}{x}]}-1 \to R_f=[-1,0)$

$0\leq \frac{1}{x}-[\frac{1}{x}]<1$

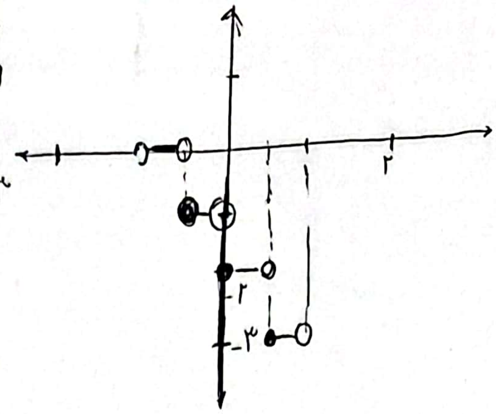
-۷

الف) $[-2x]-1$ $\quad x\in(-1,1) \longrightarrow (-1,-0/5) \to +1 \quad -1=0$

$\quad\llcorner\ [-0/5,0) \to 0 \quad -1=-1$

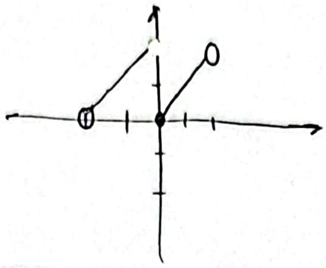
$\quad\llcorner\ [0,0/5) \to -1-1=-2$

$\quad\llcorner\ [0/5,1) \to -2-1=-3$



ب) $y=x-2\left[\frac{x}{2}\right]$ $\quad \xrightarrow{(-2,0)} x+2$

$\quad \llcorner\ [0,+2) \to x-2$



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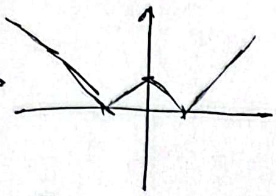
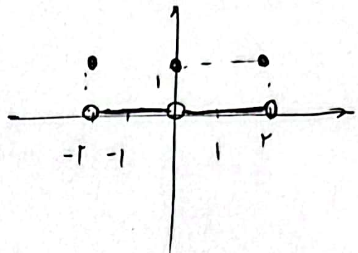
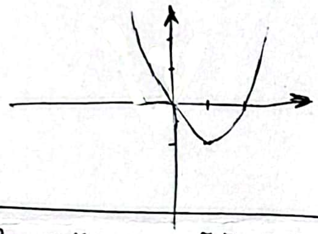
الف) [redacted] $[|x|-1]$



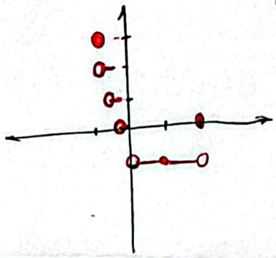
$x\in[-2,2] \to$



ب) $y=[x^2-2x]$ $\quad x\in[-1,2]$



$x\in[-1,2] \to$



-۹

$a+[b]=4/2 \to \underbrace{[a]+[b]}_{4}+\underbrace{P_a}_{\text{قسمت اعشاری } a}=4/2$ $\qquad P_a=0/2$

$b-[a]=2/4$

$\llcorner\ \underbrace{[b]-[a]}_{2}+\underbrace{P_b}_{0/4}=2/4$ $\quad\to$

$[a]+[b]=4$

$[b]-[a]=2$

$2[b]=6 \quad [b]=3 \quad [a]=1$

$[a]+[b]+P_a+P_b=4/6$

۱۰

$(1+\sqrt2)^6+(1-\sqrt2)^6=198 \longrightarrow (1+\sqrt2)^6=198-(1-\sqrt2)^6$

$-1<1-\sqrt2<0 \to 0<(1-\sqrt2)^6<1 \quad (1+\sqrt2)^6=198-(0/\ldots)=197/\ldots \quad \llcorner\ [(1+\sqrt2)^6]=197$