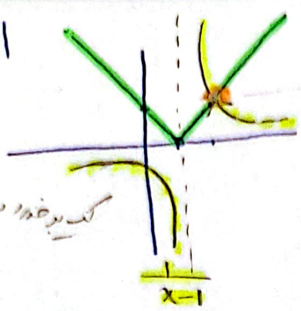
نام و نام خانوادگی ....[illegible].......... پاسخنامه تشریحی تکلیف شماره ..۲۰.. کلاس ..یازدهم رضوی..........

$\frac{1}{x-1}=|x-1|$



که [illegible] تک ریشه دارد!

ب) سوال ۲ $\left|\frac{x-2}{2x+1}\right|>1$

$$\begin{array}{c|ccccc} x & & -3 & & -\frac12 & \\ \hline & - & 0 & + & \| & - \end{array}$$

1) $\frac{x-2}{2x+1}>1 \to \frac{x-2-2x-1}{2x+1}=\frac{-x-3}{2x+1}>0$

$I:\left(-3,-\frac12\right)$

2) $\frac{x-2}{2x+1}<-1 \to \frac{x-2+2x+1}{2x+1}=\frac{3x-1}{2x+1}<0$

$$\begin{array}{c|ccccc} x & & -\frac12 & & \frac13 & \\ \hline & + & \| & - & 0 & + \end{array}$$

$II:\left(-\frac12,\frac13\right)$

ج: $I\cup II$: $\left(-3,\frac13\right)-\left\{-\frac12\right\}$

جواب قسمت ب در سوال ۱ ↑

۲ الف) $\left|\frac{2x-1}{x}\right|<2 \to -2<\frac{2x-1}{x}<2$

$\frac{2x-1}{x}<2 \to \frac{\cancel{2x}-1-\cancel{2x}}{x}<0 \to \frac{1}{x}>0$

$$\begin{array}{c|ccc} x & & 0 & \\ \hline & - & \| & + \end{array}$$

$I:(0,+\infty)$

و

$-2<\frac{2x-1}{x} \to 0<\frac{2x-1+2x}{x} \to \frac{4x-1}{x}>0$

$$\begin{array}{c|ccccc} x & & 0 & & \frac14 & \\ \hline & + & \| & - & 0 & + \end{array}$$

$II:(-\infty,0)\cup\left(\frac14,+\infty\right)$

$x: I\cap II: \left(\frac14,+\infty\right)$

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۳ $|x+6|>x^2$

$|x-\alpha|<\beta \to -\beta<x-\alpha<\beta \xrightarrow{+\alpha} \alpha-\beta<x<\alpha+\beta \to -2<x<3$

$x+6>x^2 \to x^2-x-6<0 \to (x-3)(x+2)<0$

$$\begin{array}{c|ccccc} x & & -2 & & 3 & \\ \hline & + & 0 & - & 0 & + \end{array}$$

$I:(-2,3)$

یا

$x+6<-x^2 \to x^2+x+6<0 \to \Delta=1-4(1)(6)<0,\ a>0 \to$ همواره + $\quad II:\varnothing$

$x: I\cup II: (-2,3)$

$\begin{cases}\alpha-\beta=-2\\ \alpha+\beta=3\end{cases} \to 2\alpha=1 \to \alpha=\frac12,\ \beta=\frac52$

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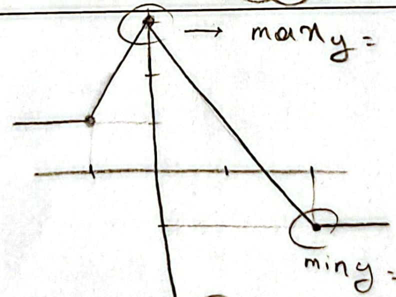
۴ $y=|\underbrace{x+1}_{-1}|-|\underbrace{2x}_{0}|+|\underbrace{x-2}_{2}|=$

$x<-1$	$-1<x<0$	$0<x<2$	$x>2$
$-\cancel{x}-1+2\cancel{x}$ $-\cancel{x}+2=1$	$\cancel{x}+1+2x$ $-\cancel{x}+2$ $=2x+3$	$\cancel{x}+1-2x$ $-\cancel{x}+2$ $=-2x+3$	$\cancel{x}+1-\cancel{2x}+\cancel{x}-2$ $=-1$
	1	3	-1



$\to \max y=3$

$\min y=-1$

$\max+\min=3-1=2$

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۵ $y=\left|\frac12 x\right|-2 \xrightarrow[\text{۱ واحد به طرف y های (+)}]{\text{۴ واحد به طرف x های منفی}} \left|\frac12(x+4)\right|-2+1=\left|\frac12 x+2\right|-1$

با طول ۳-

$\left|\frac12 x\right|-\underset{-1}{\cancel{2}}=\left|\frac12 x+2\right|-\cancel{1} \xrightarrow{(\ )^2} \frac14\cancel{x^2}+\cancel{1}-2\left|\frac12 x\right|=\frac14\cancel{x^2}+\overset{3}{\cancel{4}}+2x$

$-|x|=2x+3 \to 3x+|x|=-3 \to \begin{cases}3x+x=-3 \to x=-1 & \text{غ ق ق}\\ 3x-x=-3 \to x=-3 & \text{ق ق}\end{cases}$

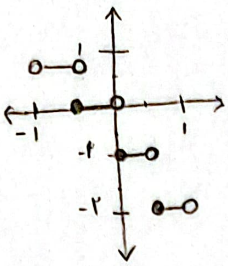
الف) $y=[-2x]-1 \quad x\in(-1,1)$

$-1<x<-\frac{1}{2}$ $\quad y=2-1=1$

$-\frac{1}{2}\leq x<0$ $\quad y=1-1=0$

$0\leq x<\frac{1}{2}$ $\quad y=0-1=-1$

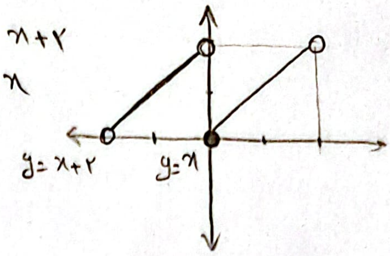
$\frac{1}{2}\leq x<1$ $\quad y=-1-1=-2$



ب) $x-2\left[\frac{x}{2}\right] \quad x\in(-2,2)$

$-2<x<0$ $\quad y=x+2$

$0\leq x<2$ $\quad y=x$

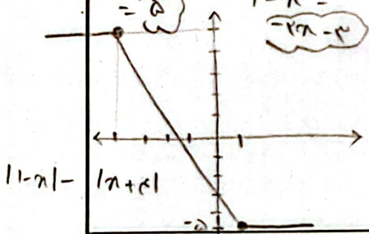


۷

الف) $f(x)=[\underbrace{|1-x|}_{x-1}-|x+4|]$

$-4 \qquad 1$

$x+4-x+1=5$ $\qquad$ $1-x=-2x-3$ $\qquad$ $x-1-x-4=-5$



$R_f:[-5,5]$

$\downarrow [\,]$

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

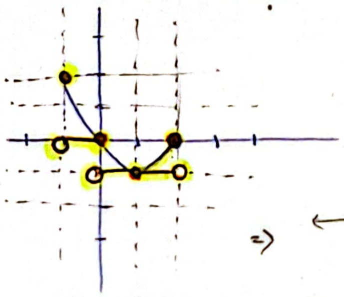
ب) $f(x)=\frac{1}{x}-\left[\frac{x+1}{x}\right]=\frac{1}{x}-\left[1+\frac{1}{x}\right]=\frac{1}{x}-\left[\frac{1}{x}\right]-1$

$\xrightarrow{\frac{1}{x}=t}$ $t-[t]-1=[-1,0)$

$R_f:[0,1)$

۶

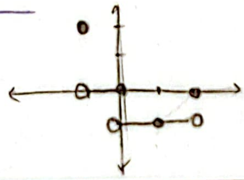
ب) $y=[x^2-2x] \quad x\in[-1,2]$



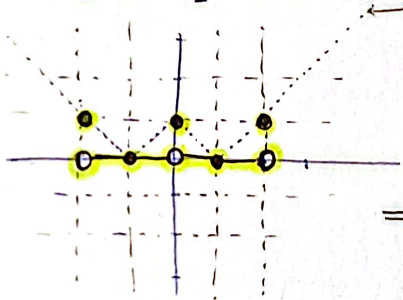
$x_{min}=\frac{-b}{2a}=\frac{2}{2}=1$

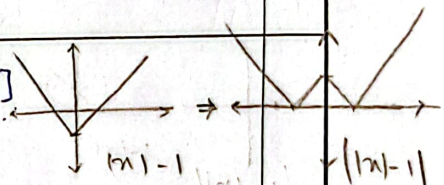
$y_{min}=1-2=-1$

$\Rightarrow$

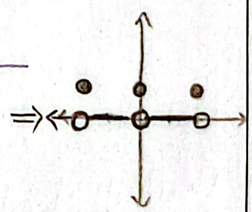


الف) $[||x|-1|] \quad x\in[-2,2]$





$\Rightarrow$



۸

$a+[b]=4{,}2$

$[b]=4\ ,\ a=0{,}2\rightarrow[a]=0$ ✗

$b-[a]=2{,}4$

$b-[a]=2{,}4\rightarrow b=2{,}4\rightarrow[b]\neq4$ غلط ✗

$[b]=3\ ,\ a=1{,}2\rightarrow[a]=1$ ✓

$b-[a]=2{,}4\rightarrow b=3{,}4\rightarrow[b]=3$ درست ✓

$a+b=1{,}2+3{,}4=4{,}6$

۹

$(1+\sqrt{2})^6+(1-\sqrt{2})^6=198 \Rightarrow 0<\sqrt{2}-1<1 \xrightarrow{(\,)^6} 0<(\sqrt{2}-1)^6<1$

$(\sqrt{2}-1)^6 \quad 1<\sqrt{2}<2$

$\underbrace{(1-\sqrt{2})^6}_{(0,1)}=198-\underbrace{(1+\sqrt{2})^6}_{(0,1)} \rightarrow 0<198-(1+\sqrt{2})^6<1 \rightarrow 197<(1+\sqrt{2})^6<198$

$\xrightarrow{[\,]}$ $[(1+\sqrt{2})^6]=197$

۱۰