نام و نام خانوادگی: زارعی   شماره تکلیف = ۲۰   کلاس = سه‌شنبه ترم ۵ دختر یازدهم

۱)

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

$x>1 \to \frac{1}{x-1} = x-1 \to 1 = x^2-2x+1 \to x(x-2)=0$ ، $x=2$ ، $x=0$ غ‌ق

$x<1 \to \frac{1}{x-1} = x+1 \to 1 = -x^2+2x-1 \to \Delta<0$ ✗

$\boxed{\text{۱ ریشه دارد}}$

۲)

الف)

$\left|\frac{2x-1}{x}\right|<2$

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

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

$① \cup ② \longrightarrow (\frac{1}{4}, +\infty)$

ب)

$\left|\frac{x-2}{2x+1}\right|>1$

$|x-2|^2>|2x+1|^2 \to 3x^2+8x-3<0$

$\to -3<x<\frac{1}{3}$ و $x\neq-\frac{1}{2}$

۳)

$x^2<|x+6|$

① $x^2<x+6 \to x^2-x-6<0 \to (x-3)(x+2)<0 \to (-2,3) \to \frac{3+(-2)}{2}=\frac{1}{2}$ ، $\frac{3+2}{2}=\frac{5}{2}$

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

$|x-\frac{1}{2}|<\frac{5}{2}$

$\beta=\frac{5}{2}$ ، $\alpha=\frac{1}{2}$

۴)

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

$x\geq2 \to x+1-2x+x-2 \to y=-1$

$0\leq x<2 \to x+1-2x-x+2 \to y=-2x+3 \xrightarrow{[0,2)} (-1,3]$

$-1\leq x<0 \to x+1+2x-x+2 \to y=2x+3 \xrightarrow{[-1,0)} [1,3)$

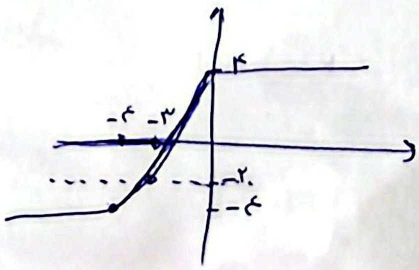
$x<-1 \to -x-1+2x-x+2 \to y=1$

بیشترین $=3$
کمترین $=-1$
$3-1=2$

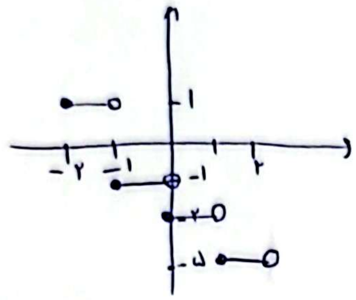
۵)

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

$|x+4|-|x|=2$



$f(x)=[|1-x|+|x+4|]$



$R_f=\{x|x\in Z, -5\le x\le 5\}$

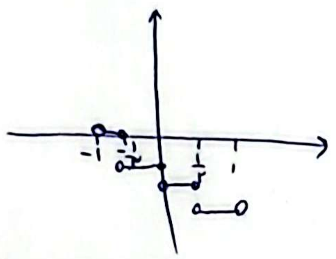
$R_f=\{-5,-4,-3,-2,-1,0,1,2,3,4,5\}$

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

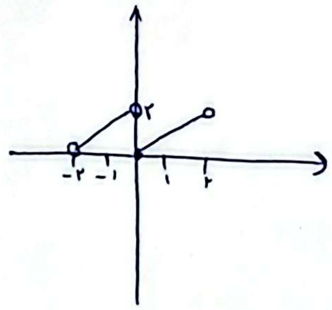
$y=\frac{1}{x}-[\frac{1}{x}]-1$

$R_f=[-1,0)$ 6

$y=[-2x]-1 \quad x\in(-1,1)$



$y=x-2[\frac{x}{2}] \quad x\in(-2,2)$



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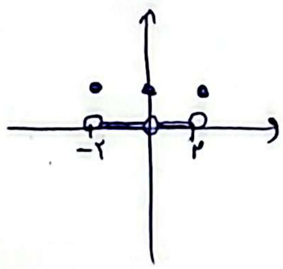
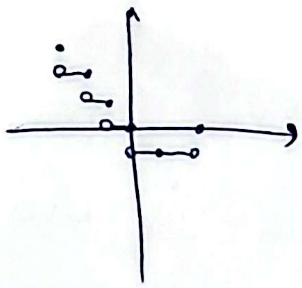
$y=[||x|-1|] \quad x\in[-2,2]$



$y=[x^2-2x] \quad x\in[-1,2]$



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$a+[b]=4/2 \rightarrow a=1/2$

$b-[a]=2/6 \rightarrow b=3/6$

$[a]+[b]=4$

$+\ [b]-[a]=2$

$2[b]=6 \rightarrow [b]=3$

$\longrightarrow a+[\underset{3}{\cancel{b}}]=4/2 \rightarrow a=1/2$

$b=3/6$

$a+b=1/2+3/6=\boxed{4/8}$ 9

$(1+\sqrt{2})^4=198-(1-\sqrt{2})^4 \xrightarrow{①} (1+\sqrt{2})^4=197/\ldots$ ②

$\xrightarrow{①} 0<-1+\sqrt{2}<1 \xrightarrow{\text{به توان ۴}} 0<(1-\sqrt{2})^4<1$

$\xrightarrow{②} [(1+\sqrt{2})^4]=\boxed{197}$ 10

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