فاطمه ... - ۳۰ ... دهم ریاضی

Date No

1- $\frac{1}{x-1} = |x-1| \to x\neq 1 , x>1 \Rightarrow \frac{1}{(x-1)^2} = (x-1)^2 \Rightarrow 1=(x-1)^4 \to (x-1)^4-1=0$

$\Rightarrow ((x-1)^2-1)((x-1)^2+1)=0 \Rightarrow (x-2)\times x \times (\underbrace{x^2-2x+2}_{\Delta<0})=0 \Rightarrow x=0 \to$ غق ، $x=2$

2- الف) $\xrightarrow{\text{توان ۲}} \frac{4x^2-4x+1}{x^2}<4 \Rightarrow \frac{4x^2-4x+1}{x^2}-\frac{4x^2}{x^2}<0 \Rightarrow \frac{-4x+1}{x^2}<0 \Rightarrow$ $0 \quad \frac{1}{4}$; $+ \quad + \quad -$

$\Rightarrow x=[\frac{1}{4},+\infty)$

ب) $\xrightarrow{\text{توان ۲}} \frac{x^2-4x+4}{4x^2+4x+1}>1 \Rightarrow \frac{x^2-4x+4-4x^2-4x-1}{4x^2+4x+1}>0 \Rightarrow \frac{-3x^2-8x+3}{4x^2+4x+1} \Rightarrow$ $-3 \quad -\frac{1}{2} \quad \frac{1}{3}$; $+ \quad - \quad - \quad +$

$\frac{-3(x+3)(3x-1)}{(2x+1)^2}$; -3 ; $-\frac{1}{2}$ $\Rightarrow x=(-\infty,-3)\cup(\frac{1}{3}$...

3- $x^2<|x+6| \to |x-\alpha|<\beta$

توان ۲ $x^4<x^2+12x+36 \to x^4-x^2-12x-36<0 \to (\underbrace{x^2+x+6}_{\Delta<0})(\underbrace{x^2-x-6}_{(x-3)(x+2)})<0$

$\to$ $-2 \quad 3$; $+ \quad - \quad +$ $\Rightarrow x\to(-2,3) \Rightarrow b=3-\frac{1}{2}=\frac{5}{2}$

$\frac{3-2}{2}=\frac{1}{2}$ $\Rightarrow |x-\frac{1}{2}|<\frac{5}{2} \Rightarrow \alpha=\frac{1}{2}$

4- $x=-1,0,2 \xrightarrow{\text{صفر قدر مطلق ها}}$

$x\le -1 \to y=-x-1-2x-x+2 \Rightarrow y=-4x+1$

$-1\le x\le 0 \to y=x+1+2x-x+2=2x+3$

$0<x\le 2 \to y=3-2x$

$2\le x \to y=-1$

$\Rightarrow \begin{cases} max=3 \\ min=-1 \end{cases} \Rightarrow 3-1=2$

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

$\to \frac{1}{2}|x+4|-1=\frac{1}{2}|x|-2 \Rightarrow -\frac{1}{2}|x+4|+\frac{1}{2}|x|=+1 \to |x+4|+|x|=2 \Rightarrow x=-3$

6- الف) $f(x)=[|1-x|-|x+4|] \to x=1,-4$

$x<-4 \to [1-x+x+4]=[5]=5$

$-4\leq x<1 \to [1-x-x-4]=[-2x-3] \to A=\{-5,-4,-3,-2,-1,0,1,2,3,4,5\} \Rightarrow R_f=A$

$1\leq x \to [x-1-x-4]=[-5]=-5$

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

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

$\Rightarrow R_f=[0,1)$

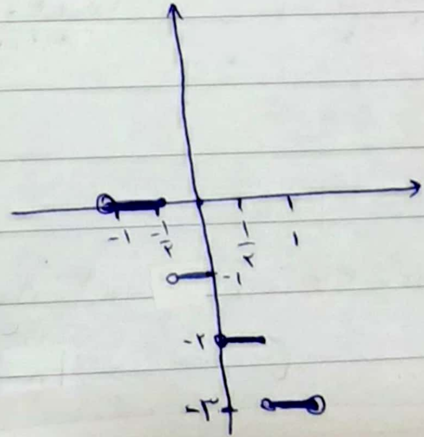
7- الف) $y=[-2x]-1 \quad x\in(-1,1)$

$-1<x\leq-\frac{1}{2} \to [-2x]=1 \Rightarrow y=0$

$-\frac{1}{2}<x\leq 0 \to [-2x]=0 \Rightarrow y=-1$

$0<x\leq\frac{1}{2} \to [-2x]=-1 \Rightarrow y=-2$

$\frac{1}{2}<x<1 \to [-2x]=-2 \Rightarrow y=-3$



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

$-2<x<-1 \to \left[\frac{x}{2}\right]=$

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۹- $a+[b]=۴/۲ \Rightarrow a-[a]=۰/۲$
$b-[a]=۲/۴ \Rightarrow b-[b]=۰/۴$
$\Rightarrow [b]+[a]=۴ \Rightarrow a+b=۴/۶$
$۰/۲+۰/۴=۰/۶<۱$

۱۰- $\left((۱-\sqrt{۲})^۲+(۱-\sqrt{۲})^۲\right)\left((۱+\sqrt{۲})^۴+(۱-\sqrt{۲})^۴-(۱-\sqrt{۲})^۲(۱+\sqrt{۲})^۲\right)$
$=۶\times(۱۷+۶\sqrt{۸}+۱۷-۶\sqrt{۸}-۱)=۶\times۳۳=\boxed{۱۹۸}$