ملیکا محمدحسینی

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$\frac{1}{x-1} = |x-1|$ $\qquad D = x \neq 1$

$x-1>0 \to x>1 \to |x-1| = x-1 \to \frac{1}{x-1} = x-1 \to (x-1)^2 = 1 \to x-1=\pm 1 \to x=2$

$x-1<0 \to |x-1| = -(x-1) \to \frac{1}{x-1} = -(x-1) \to (x-1)^2 = -1$

$x=2$

1) $\left|\frac{2x-1}{x}\right| < 2 \to -2 < \frac{2x-1}{x} < 2 \to x \neq 0 \to \frac{2x-1-2x}{x} < 0 \to \frac{-1}{x} < 0$

(اگر $x>0$) $\to -2 < \frac{2x-1}{x} \to \frac{2x-1+2x}{x} > 0 \to \frac{4x-1}{x} > 0.$

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

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

2) $\left|\frac{x-2}{2x+1}\right| > 1 \to 2x+1 \neq 0 \to x \neq -\frac{1}{2} \to \frac{x-2}{2x+1} > 1 \to \frac{x-2-(2x+1)}{2x+1} > 0 \to \frac{-x-3}{2x+1} > 0$

$-x-3<0 \,,\, 2x+1<0 \to x>-3 \,,\, x<-\frac{1}{2} \to -3<x<-\frac{1}{2}$

$\frac{x-2}{2x+1} < -1 \to \frac{x-2+2x+1}{2x+1} < 0 \to \frac{3x-1}{2x+1} < 0$ $\quad x<\frac{1}{3}$ $\quad x>-\frac{1}{2}$

$-\frac{1}{2} < x < \frac{1}{3} \to (-3,-\frac{1}{2}) \cup (-\frac{1}{2},\frac{1}{3})$

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

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

$\boxed{-2<x<3}$

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

$\Delta = 1-24 = -23 < 0$ ✗

$|x-\alpha| < \beta \to \alpha = \frac{-2+3}{2} = \frac{1}{2}$

$\beta = \frac{3-(-2)}{2} = \frac{5}{2}$

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

$x = -1, 0, 2$

1) $x<-1 \to y=1$

2) $-1 \leq x < 0 \to y = 2x+3$

3) $0 \leq x < 2 \to y = 3-2x$

4) $x \geq 2 \to y=-1$

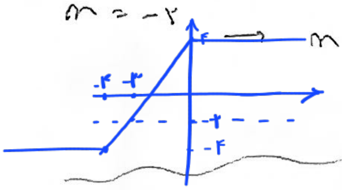
$3 + (-1) = 2$ ← بیشترین

کمترین

محسنی

$y=|\frac{1}{2}x|-2 \to |\frac{x}{2}|-2 \to |\frac{x+4}{2}|-1 \to |\frac{x}{2}-2|=|\frac{x+4}{2}|-1$ 0/5

$x=-2$



x ملک $=-2$

$y'=|\frac{1}{2}x+2|-1=y$ $x=-2$ محل تقاطع در   محور بیشینه = ۰ دکمینه = ۰

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

$y=|x-1|-|x+4|=$

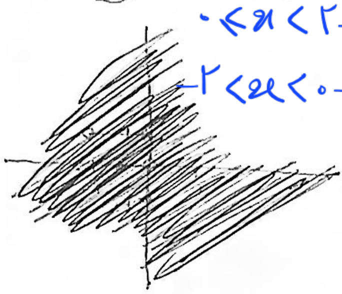
$x<-4 \to y=-5$

$-4\le x<1 \to y=-2x-3$ $\to R=[-5,5]$

$x=1,\ x=-4$ $x\ge 1 \to y=-5$

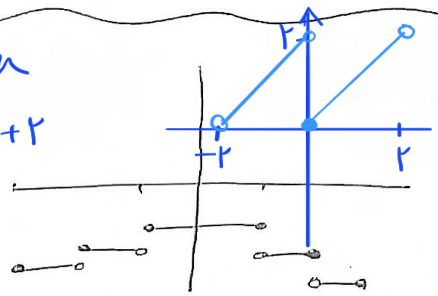
$\frac{1}{x}-[\frac{x+1}{x}]=$ ب) $f(x)=\underbrace{\frac{1}{x}-[\frac{1}{x}]}_{0\le\ \ <1}-1 \to R_f=[-1,0)$ 1

0



$0<x<2 \to x$

$-2<x<0 \to x+2$

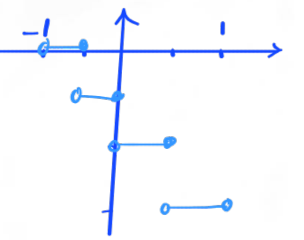


$0<x\le\frac{1}{2} \to -2$

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

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

$-1<x\le -\frac{1}{2}$



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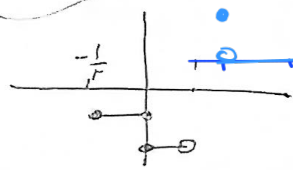

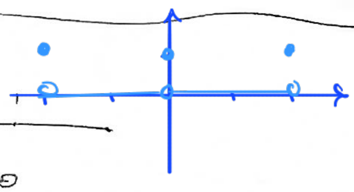

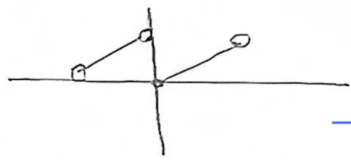

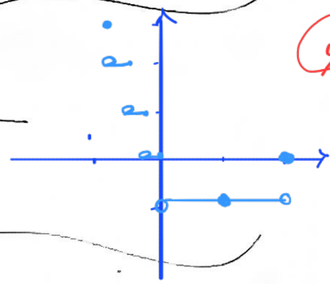

$a=[a]+\{a\},\ b=[b]+\{b\}$

$\{a\}+[a]+[b]=4/4$ $\{a\}<1$

$\{b\}+[b]-[a]=2/4 \to \{b\}<1$

$\{b\}<1 \to [b]-[a]=2 \to \{b\}=0/4 \to \{a\}+[a]+[b]=4/2$

$[b]=[a]+2 \to \{a\}+[a]+[b]=4/2$ 2

$2[a]+2+\{a\}=4/2 \to 2[a]+\{a\}=2/2 \to [a]=1 \to 2\times 1+\{a\}=2/2$

$\{a\}=0/2$ $a=1+0/2=1/2$ $b=1+2+0/4=3/4$

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

$(1-\sqrt{2})^6=99-70\sqrt{2}$

$(1+\sqrt{2})^2=3+2\sqrt{2}$ 1/5 $198=99+99$ = مجموع

$(1+\sqrt{2})^3=7+5\sqrt{2}$

$(1+\sqrt{2})^6=(7+5\sqrt{2})^2=99+70\sqrt{2}$ $99+70\sqrt{2}\simeq 99+98/99=\boxed{197/99}$ جزء صحیح

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$$\left[(1+\sqrt{2})^6\right] = \left[198 - (1-\sqrt{2})^6\right] \qquad 0<(1-\sqrt{2})^6<1$$

$$= \left[(1+\sqrt{2})^6\right] = 198 + \Big[\underbrace{-(1-\sqrt{2})^6}_{0^-}\Big] = 198 - 1 = 197$$