نام و نام خانوادگی: لیلا رحیمی — شماره تکلیف: 20 — دوره یازدهم هنر A

1

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

$\xrightarrow{②} x<1 \to \frac{1}{x-1}=1-x \to -x^2+2x-1=1$

$x \neq 1$

$① \to x=1$ غ ق ق

$x=2$ ق ق ✓

$x^2-2x+2=0 \to \Delta<0$

ریشه ندارد

$4-4(1)(2)$

2

$\left|\frac{2x-1}{x}\right|<2 \Rightarrow -2<\frac{2x-1}{x}<2 \nearrow 0<\frac{2x-1+2x}{x} \to 0<\frac{4x-1}{x} \to (-\infty,0)\cup(\frac{1}{4},+\infty)\ \mathrm{I}$

$\searrow \frac{2x-1-2x}{x}<0 \to \frac{-1}{x}<0 \to (0,+\infty)\ \mathrm{II}$

$\xRightarrow{\mathrm{I}\cap\mathrm{II}} (\frac{1}{4},+\infty)$

$\left|\frac{x-2}{2x+1}\right|>1 \Rightarrow \frac{x-2}{2x+1}<-1 \to \frac{x-2+2x+1}{2x+1}<0 \Rightarrow \frac{3x-1}{2x+1}<0 \Rightarrow (-\frac{1}{2},\ldots)$

$\frac{x-2}{2x+1}>1 \to \frac{x-2-2x-1}{2x+1}>0 \Rightarrow \frac{-x-3}{2x+1}>0 \Rightarrow (-3,\ldots)$

$\varnothing$

3

$x^2<|x+6| \to x^2<x+6 \to x^2-x-6<0 \to (x-3)(x+2)<0 \quad \boxed{(-2,3)}$

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

$-\beta<x-\alpha<\beta \xrightarrow{+\alpha} \overset{-2}{-\beta+\alpha}<x<\overset{3}{\beta+\alpha} \to \begin{cases}-\beta+\alpha=-2\\ \beta+\alpha=3\end{cases} \Rightarrow 2\alpha=1 \to \alpha=\frac{1}{2}$

$\beta=\frac{5}{2}$

$+1-4+4=$

$4-6+1 \quad 2-4+1=$

4

$|11|-|20|+|8|=-1$

$|-9|-|-2|+|-12|=1$

$|0|-|-2|+|-3|=1$

$|4|-5+2=3$

$|101|-|200|+|98|=1$

$0-2+3=1$

$\begin{array}{cccc} & -1 & 0 & 2 \\ + & - & + & - \end{array}$

بیشترین مقدار $\leftarrow 3$

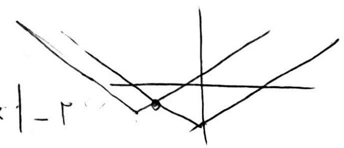
کمترین مقدار -1

$3-1=2$

5

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

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



$\left|\frac{1}{2}x\right|-\left|\frac{1}{2}x+4\right|=1$

$\begin{array}{ccc} -8 & & 0 \\ - & + & + \end{array}$

$|t|-|t+4|=1$

$|t|=1+|t+4|$

$-3 = 2x+3 \qquad -3 = -2x-3$

6

$[\,|1-x| - |x+4|\,] \Rightarrow \begin{cases} x>1 \to [-2x]-3 \\ -4 \leqslant x \leqslant 1 \quad -5 \\ x<-4 \quad [2x]+3 \end{cases}$

$R_f = \{\dots, -9, -7, -5\}$

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

$\dfrac{1}{x} - \left[\dfrac{x+1}{x}\right] \to \dfrac{1}{x} - \left[1+\dfrac{1}{x}\right]$

$\Rightarrow \dfrac{1}{x} - \left[\dfrac{1}{x}\right] - 1 \to 0 \leqslant \dfrac{1}{x} - \left[\dfrac{1}{x}\right] < 1 \xrightarrow{-1} -1 \leqslant \dfrac{1}{x} - \left[\dfrac{1}{x}\right] - 1 < 0$

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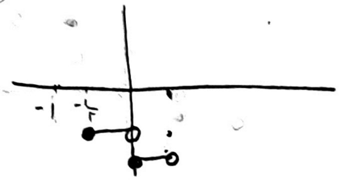
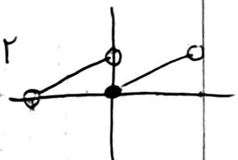
$y = [-2x] - 1 \quad x \in (-1, 1) \to -\frac{1}{2} \leqslant x < 0 \xrightarrow{x-2} 1 \geqslant -2x > 0 \to 0-1 = -1$

$0 \leqslant x < \frac{1}{2} \xrightarrow{x-2} 0 \geqslant -2x > -1 \to -1-1 = -2$



$y = x - 2\left[\dfrac{x}{2}\right] \quad x \in (-2, 2) \to -2 < x < 0 \xrightarrow{\times \frac{1}{2}} -1 < \dfrac{x}{2} < 0 \to x+2$

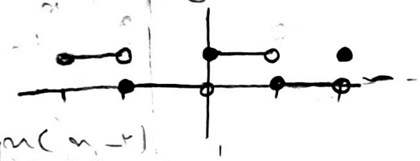
$0 \leqslant x < 2 \xrightarrow{\times \frac{1}{2}} 0 \leqslant \dfrac{x}{2} < 1 \to x$



8

$[\,|\,|x|-1\,|\,] \quad x \in [-2, 2] \to -2 \leqslant x < 0 \to [\,|-x-1|\,] \to \begin{cases} -2 \leqslant x < -1 \to [-x-1] \to 1 \\ -1 \leqslant x < 0 \to [x+1] \to 0 \end{cases}$

$0 \leqslant x \leqslant 2 \to [\,|x-1|\,] \to \begin{cases} 0 \leqslant x < 1 \to [-x+1] \to 1 \\ 1 \leqslant x \leqslant 2 \to [x-1] \to 0, 1 \end{cases}$

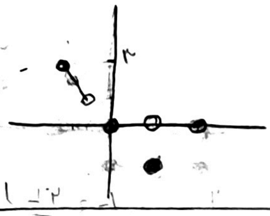


$[x^2 - 2x] \quad x \in [-1, 2]$

$-1 \leqslant x < 0 \to 3$

$0 \leqslant x < 1$

$1 \leqslant x < 2$



9

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

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

$a + 2 + [a] = 4{,}2 \to a + [a] = 2{,}2 \to \begin{cases} 2{,}2 - \cancel{[a]} = a \\ 2{,}4 + \cancel{[a]} = b \end{cases} \to a+b = 4{,}6$

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

$[(1+\sqrt{2})^6] = [198 - (1-\sqrt{2})^6] = 198 + [-(1-\sqrt{2})^6] = 198 - 1 = 197$

$-0{,}6$