

۱۴, ۲۵

اسیر مردی سزوی یا B، تکلیف ۲۰

$$\frac{1}{x-1} = |x-1| \Rightarrow \frac{1}{x-1} = \pm \frac{(x-1)^2}{x-1}$$

(۱)

(۲)

$$\Rightarrow 0 = \frac{1 \pm (x-1)^2}{x-1} \Rightarrow \frac{(1+x-1)(1-x)}{x-1} = 0 \Rightarrow x = 1$$

$\downarrow$
غنی

$$\hookrightarrow 1 + (x-1)^2 > 0 \Rightarrow x$$

✓ $\frac{1}{x} = \frac{1}{1}$

$$-2 \leq \frac{x-1}{x} < 2 \Rightarrow -2 \leq 1 - \frac{1}{x} < 2$$

(۲)

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

(۲)

$$\Rightarrow x > \frac{1}{2} \Rightarrow x \in \left(\frac{1}{2}, +\infty\right) \checkmark$$

$$\frac{x-2}{2x+1} > 1, \quad \frac{x-2}{2x+1} < -1$$

$$\hookrightarrow \frac{x-2}{2x+1} - 1 > 0 \Rightarrow \frac{-x-3}{2x+1} > 0 \Rightarrow -\frac{3}{1} < -\frac{1}{2} < +\infty \Rightarrow x \in \left(-3, -\frac{1}{2}\right)$$

$$\frac{x-2}{2x+1} + 1 < 0 \Rightarrow \frac{3x-1}{2x+1} < 0 \Rightarrow -\infty < \frac{1}{3} < \frac{1}{-1} < +\infty \Rightarrow x \in \left(-\frac{1}{3}, \frac{1}{2}\right)$$

$$\left(-\frac{1}{3}, \frac{1}{2}\right) \cup \left(-3, -\frac{1}{2}\right) = \left(-3, -\frac{1}{2}\right) \cup \left(-\frac{1}{3}, \frac{1}{2}\right) \checkmark$$

$$-B \leq x - A < B \Rightarrow A - B \leq x < A + B$$

(۲) (۳)

$$x^2 < x + 1 \quad x + 1 < -x^2 \Rightarrow x^2 + x + 1 < 0 \quad \Delta < 0$$

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$$x^2 - x - 1 < 0 \Rightarrow \frac{1 \pm \sqrt{5}}{2} = \frac{3}{2}$$

$\downarrow$

$$x^2 - x - 1 < 0 \Rightarrow \frac{1 \pm \sqrt{5}}{2} = \frac{3}{2}$$

$\downarrow$

$$x = \frac{1}{2} \checkmark$$

$\downarrow$

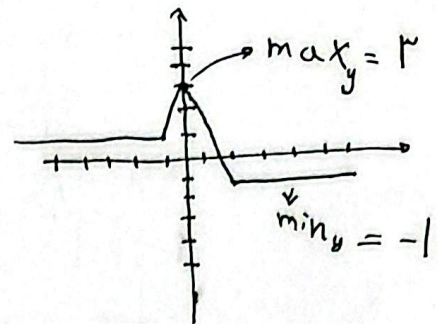
$$B = \frac{3}{2}$$

$$-2 \leq \frac{3}{2} < +\infty$$

$$\Rightarrow \left(-2, \frac{3}{2}\right) \cup \emptyset = D \Rightarrow A - B = -2$$

$$y = \frac{|x+1|}{-1} - \frac{|2x|}{0} + \frac{|x-2|}{2}$$

$$\Rightarrow \begin{cases} x > 2 \Rightarrow y = -1 \\ 0.5x \leq 2 \Rightarrow y = -2x + 3 \\ -1.5x \leq 0 \Rightarrow y = 2x + 3 \\ x \leq -1 \Rightarrow y = 1 \end{cases}$$



$$\max_y + \min_y = 3 - 1 = 2 \checkmark$$

(۴)

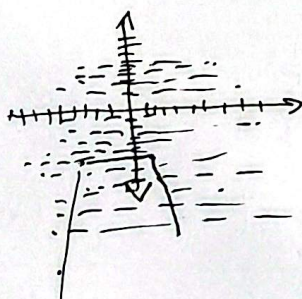
$$f(x) = \left| \frac{1}{x} \right| - 2 \Rightarrow f(x+f) = \left| \frac{1}{x+f} \right| - 2$$

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

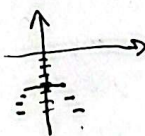
$$g(x) = f(x) \Rightarrow \left| \frac{1}{x+f} \right| - 1 = \left| \frac{1}{x} \right| - 2 \Rightarrow \left| \frac{1}{x+f} \right| - \left| \frac{1}{x} \right| + 1 = 0$$

$$\Rightarrow -1 = 0 \quad \left| \frac{1}{x+f} \right| - \left| \frac{1}{x} \right| + 1 = 0 \quad \Rightarrow x = -3 \Rightarrow y = -\frac{1}{3} \checkmark$$

$$\text{الف) } |1-x| - |x+f| \quad 2x+3 \quad -5 \quad | -3-2x \quad (6)$$



$$R = \{k \in \mathbb{Z} \mid k \leq 5\}$$

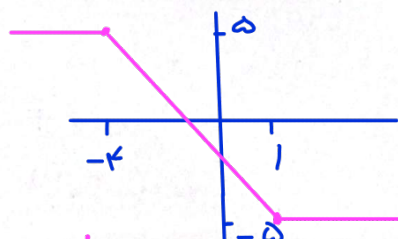


$$\therefore \frac{1}{x} - 1 - \left[-\frac{1}{x}\right] = \in - [-\infty] - 1 \Rightarrow R = [-1, 0) \checkmark$$

$$[|n-1| - |n+4|]$$

تابع آبیاری

$$R = \{-5, -4, \dots, 5\}$$



الف ۶

چون مبالغ داریم، برد فقط شامل اعداد صحیح این بازه می باشد

$$\begin{aligned} [a + [b]] = 4 &\rightarrow [a] + [b] = 4 \\ [b - [a]] = 2 &\rightarrow [b] - [a] = 2 \end{aligned} \Rightarrow \begin{cases} [a] = 1 \\ [b] = 3 \end{cases} \quad \underline{9}$$

$$\begin{aligned} b - [a] = 1, 4 &\rightarrow b = 3, 4 \\ [b] + a = 4, 2 &\rightarrow a = 1, 2 \end{aligned} \rightarrow a + b = \boxed{4, 4}$$

$$(1 + \sqrt{2})^4 = 19\lambda - (1 - \sqrt{2})^4$$

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$$[(1 + \sqrt{2})^4] = [19\lambda - (1 - \sqrt{2})^4] = 19\lambda + \underbrace{[-(1 - \sqrt{2})^4]}_{[0^-]} = \boxed{19\lambda}$$