

عسل کا مرے بازدم بیوشہ دفعہ ۲۰

سوال ← $\frac{1}{x-1} = |x-1| \xrightarrow{x-1 \neq 0} \frac{1}{+} = |1|$

$\frac{1}{x-1} > 0 \rightarrow + = |1| \Rightarrow \frac{1}{+} = + \Rightarrow +^2 = 1 \rightarrow + = 1$
 $\frac{1}{x-1} < 0 \rightarrow |1| = -+ \rightarrow \frac{1}{+} = -+ \rightarrow -+^2 = 1$ (غیر قابل قبول)
 $\rightarrow + = 1 \rightarrow x-1 = 1 \rightarrow \boxed{x=2}$ (۵)

سوال ← $| \frac{2x-1}{x} | < 2 \rightarrow -2 < \frac{2x-1}{x} < 2$

$\rightarrow \begin{cases} \frac{2x-1}{x} < 2 \Rightarrow \frac{2x-1-2x}{x} < 0 \rightarrow \frac{-1}{x} < 0 \Rightarrow x > 0 \\ -2 < \frac{2x-1}{x} \Rightarrow \frac{2x-1+2x}{x} > 0 \Rightarrow \frac{4x-1}{x} > 0 \Rightarrow [x-1] > 0 \end{cases}$

$\rightarrow x > 0 \Rightarrow x > \frac{1}{4}, [x-1] < 0 \leq x < 0 \Rightarrow x < 0$

$\frac{0}{\text{است}} \Rightarrow x \geq \frac{1}{4} \Rightarrow [\frac{1}{4}, +\infty)$
 * $x \neq 0$ چون در مخرج است

ب) $| \frac{x-2}{2x+1} | > 1 \rightarrow 2x+1 \neq 0 \rightarrow x \neq -\frac{1}{2}$

$\rightarrow \textcircled{1} \frac{x-2}{2x+1} < -1 \rightarrow 1 - \frac{(x-2)}{2x+1} < 0 \rightarrow \frac{2x+1-x+2}{2x+1} = \frac{x+3}{2x+1} < 0$

$\rightarrow (-3, -\frac{1}{2})$

$\textcircled{2} \frac{x-2}{2x+1} < -1 \rightarrow \frac{x-2}{2x+1} + 1 < 0 \rightarrow \frac{x-2+2x+1}{2x+1} < 0$

$\rightarrow \frac{3x-1}{2x+1} < 0 \rightarrow (-\frac{1}{3}, -\frac{1}{2})$
 $\textcircled{1,2} \rightarrow (-3, -\frac{1}{2}) \cup (-\frac{1}{2}, -\frac{1}{3})$

Scanned with

$$x^2 < |x+4|$$

سوال ۴

$$\textcircled{1} \rightarrow x^2 < x+4 \rightarrow x^2 - x - 4 < 0 \rightarrow (x-3)(x+2) < 0$$

$$\rightarrow \begin{array}{c|c|c} -2 & +3 \\ + & - & + \end{array} \rightarrow (-2, +3)$$

۵

$$\textcircled{2} \rightarrow \text{با استفاده از تست انتهای بازه} \rightarrow x^2 < -x-4 \rightarrow x^2 + x + 4 < 0$$

و غریب آن هم مثبت است پس عبارت همراه مثبت است و نمی تواند منفی

باشد پس غیر قابل قبول است

$$\Rightarrow (2, 3) \rightarrow x \rightarrow \infty \rightarrow \infty = \frac{3 + (-2)}{2} = \left(\frac{1}{2}\right)$$

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

سوال ۵

$$\text{برای } x < -1 \rightarrow y = 1$$

$$\text{برای } -1 < x < 0 \rightarrow y = 2x + 3$$

$$\text{برای } 0 < x < 2 \rightarrow y = -2x + 3$$

$$\text{برای } x \geq 2 \rightarrow y = -1$$

$$\rightarrow y_{\max} = 3 \quad (x = -1)$$

$$\rightarrow y_{\min} = -1 \quad (x \geq 2)$$

$$\Rightarrow 3 + (-1) = 2$$

۵

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

سوال ۶

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

$$\sim \text{برای } x \geq 0 \rightarrow \frac{1}{x} = \frac{1}{x+\epsilon} \rightarrow \frac{1}{x} \leq \frac{1}{x} + 2 + 1$$

غیر قابل قبول

۵

$$\text{برای } x < -\epsilon \rightarrow -\frac{1}{x} = -\frac{1}{x+\epsilon} \rightarrow -\frac{1}{x} = -\frac{1}{x} - 2$$

$$\text{برای } -\epsilon < x < 0 \rightarrow -\frac{1}{x} = \frac{1}{x+\epsilon} \rightarrow -\frac{1}{x} \leq \frac{1}{x} + 2$$

$$\rightarrow x = -2 \quad \checkmark \checkmark$$

Scb6

الف) $f(x) = [1-x] - [x+1]$

سرای

$x \in [-1, 0] \rightarrow f(x) = (1-x) - (-(x+1)) = 1-x+x+1 = 2$

$\sim f(x) = 2$

$x \in (0, 1] \rightarrow f(x) = (1-x) - x - 1 = -2x - 3$

$f(-1) = -2(-1) - 3 = 2 - 3 = -1$

$x \geq 1 \rightarrow f(x) = (x-1) - x - 1 = -2$

$f(x) = -2$

5

$[f(x)] \rightarrow \{-2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100\}$

ب) $\frac{1}{x} \in \left[\frac{x+1}{x}\right] \quad x \neq 0$

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

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

$\rightarrow f(x) = -\left\{1 + \frac{1}{x}\right\} \in (-\infty, -1]$

الف) $y = [4x] - 1$

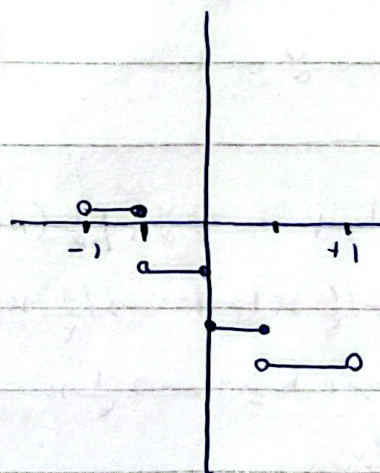
سرای

$x \in \left[\frac{1}{4}, \frac{1}{2}\right) \rightarrow -2$

$x \in \left[\frac{1}{2}, \frac{3}{4}\right) \rightarrow -3$

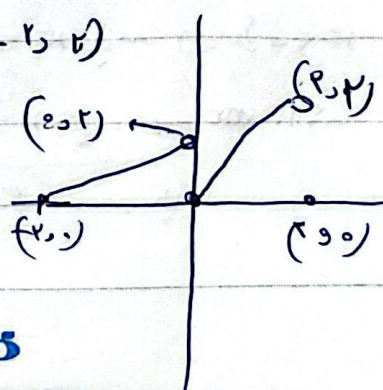
$x \in \left[\frac{3}{4}, 1\right) \rightarrow -1$

$x \in \left[1, \frac{5}{4}\right) \rightarrow -1$



5

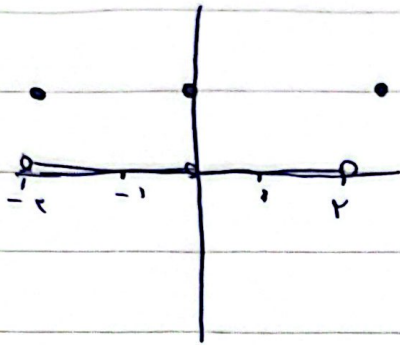
ب) $y = x - 2\left[\frac{x}{2}\right] \quad x \in (-1, 1)$



Scanned with

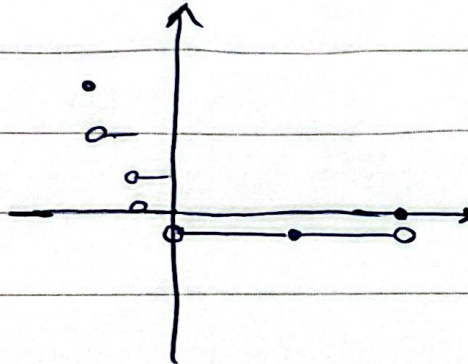
سوال ۱) $y = [|x| - 1]$ $x \in [-2, 2]$

← سوال



۵

ب) $y = [x^2 - 3x]$ $x \in [-1, 2]$



$a = [b] = 1, 2 \rightarrow a = \{1, 2\} = [b]$

← سوال

$b = [a] = 2, 1 \rightarrow b = 1, 2 = [a]$

۵

$\rightarrow b = 1, 2 = [\{1, 2\} = [b]] \rightarrow a = 1, 2, b = 1, 2 \Rightarrow a + b = \{1, 2\}$

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

← سوال

$\rightarrow (1 + \sqrt{2})^4 = [19 - (1 - \sqrt{2})^4] = [19]$

۵