

کلیف سری ۲۰

امیر محمد زویانی

یا: قسم B

۱۳

$$\frac{1}{n-1} = u-1 \rightarrow 1 = (u-1)^2 \rightarrow u-1 = \pm 1 \rightarrow u=0 \text{ X} \rightarrow u=2 \checkmark$$

(۲)

الف) $\left| \frac{u-1}{u} \right| < 2 \rightarrow -2 < \frac{u-1}{u} < 2 \rightarrow -2 < 1 - \frac{1}{u} < 2 \rightarrow -2 < -\frac{1}{u} < 0 \rightarrow \frac{1}{u} > 0 \rightarrow u > 0 \rightarrow u > \frac{1}{2} \checkmark$

(۱,۷۵)

ب) $\left| \frac{u-2}{u+1} \right| > 1 \rightarrow \frac{u-2}{u+1} > 1 \rightarrow \frac{u-2}{u+1} - 1 > 0 \rightarrow \frac{u-2-u-1}{u+1} = \frac{-u-3}{u+1} > 0 \rightarrow \frac{-u-3}{-1+1} \rightarrow (-3, -1) \checkmark$
 $\frac{u-2}{u+1} < -1 \rightarrow \frac{u-2}{u+1} + 1 < 0 \rightarrow \frac{u-2+u+1}{u+1} = \frac{2u-1}{u+1} < 0 \rightarrow \frac{-1}{-1+1} \rightarrow (-\frac{1}{2}, \frac{1}{2}) \checkmark \rightarrow \bigcup (-3, -1) \cup (-\frac{1}{2}, \frac{1}{2})$

$u^2 < |u+v| \rightarrow |u-a| < B \quad a=?$

$u > 0 \rightarrow u^2 < u+v \rightarrow u^2 - u - v < 0 \rightarrow (u-2)(u+2) > 0 \rightarrow \frac{-2 \quad 2}{+1 \quad -1} \rightarrow (-2, 2) \rightarrow u-a < B \rightarrow a-B < u < a+B$

(۲)

$\begin{cases} a-B = -2 \\ a+B = 2 \end{cases}$

$2a = 0 \rightarrow a = 0 \checkmark$

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

$u < -1 \rightarrow |u+1| = -u-1, |u-2| = 2-u \rightarrow y = -u-1 - (2-u) = -3$

$-1 \leq u < 0 \rightarrow |u+1| = u+1, |u-2| = 2-u \rightarrow y = u+1 - (2-u) = 2u-1 \rightarrow u=0 \rightarrow y=-1$

$0 \leq u < 2 \rightarrow |u+1| = u+1, |u-2| = 2-u \rightarrow y = u+1 - (2-u) = 2u-1 \rightarrow u=2 \rightarrow y=3$

$u \geq 2$

$y = -u+1 - (u-2) = -2u+3$

$\max y = 3$

$\min y = -1 \rightarrow 3-1=2 \checkmark$

(۲)

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

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

$\left| \frac{u}{x} \right| - |u+\varepsilon| = 1$

$-u - (u+\varepsilon) = 1$

$-2u - \varepsilon = 1 \rightarrow u = -\frac{1+\varepsilon}{2} \checkmark$

(۲)

بازدهی سر B
کلیف سری 10

امیر محمد فردوسی

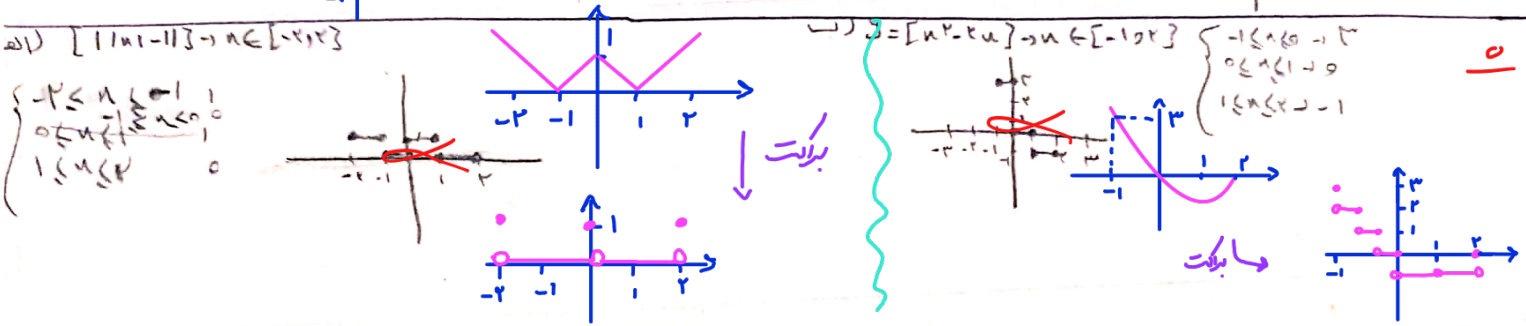
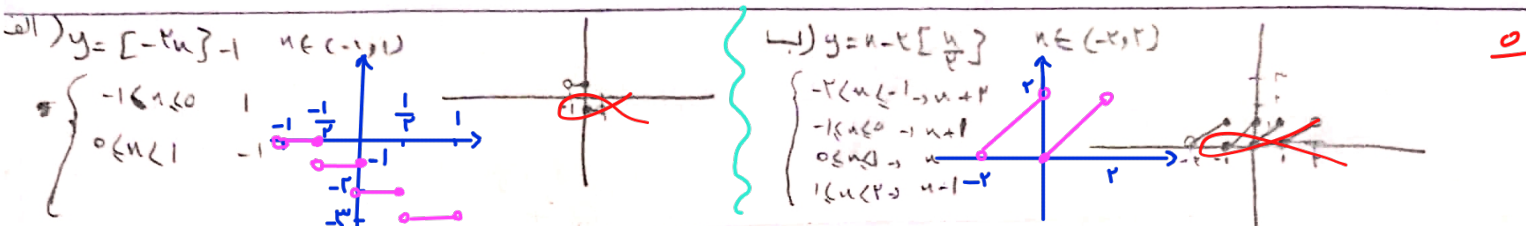
الف) $f(u) = [1 - u] - [u + 1] \Rightarrow u \leq -2 \Rightarrow 1 - u + u + 2 = 3$ $-2 \leq u \leq 1 \Rightarrow 1 - u - u - 1 = -2u$ $u > 1 \Rightarrow u - 1 - u - 1 = -2$

$R = [-5, 5]$ $\rightarrow \{-5, -4, \dots, 5\}$

چون بدلت داریم، برد مقط شامل اولد صی این بازه مرنا.

ب) $f(u) = \frac{1}{u} - [\frac{1}{u}] - 1$

$[1 + \frac{1}{u}] \rightarrow -[1] = -1$ $\rightarrow R = [-1, 0]$



$a + [b] = 3, 2$ $b - [a] = 2, 1$ $a + b = ?$

$[b] = 2$ $a \in 1, 2$ $b - [0, 1] = 2, 1 \Rightarrow b = 2, 1$

$(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 198 \Rightarrow 198 - (1 - \sqrt{2})^4 \Rightarrow 198 - 1 = 197$

$\rightarrow -1 < (1 - \sqrt{2})^4 < 1 \Rightarrow 197 < 198 - (1 - \sqrt{2})^4 < 199$

$[(1 + \sqrt{2})^4] = 198$

$[a + [b]] = 4 \rightarrow [a] + [b] = 4$

$[b - [a]] = 2 \rightarrow [b] - [a] = 2$

$\rightarrow \begin{cases} [a] = 1 \\ [b] = 3 \end{cases}$

$b - [a] = 2, 1 \rightarrow b = 3, 4$

$[b] + a = 4, 2 \rightarrow a = 1, 2$

$\rightarrow a + b = [4, 4]$