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19

$$① \frac{1}{x-1} |x-1| \rightarrow \frac{1}{x-1} = x-1 \quad x > 1$$

$$(x-1)' = 1 \rightarrow x' = 1 \quad x > 0 \rightarrow x(x-1)' = 0 \rightarrow x(x-1) = 0$$

$$\frac{1}{x-1} = -(x-1) \rightarrow x < 1 \rightarrow -(x-1)' = 1 \rightarrow x' = -1 \quad x < 0 \rightarrow x(x-1)' = 0 \rightarrow x(x-1) = 0$$

مقدار مثبت و منفی

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$$② \text{ a) } \frac{x-1}{x} < 1 \rightarrow x-1 < x \rightarrow -1 < 0 \Rightarrow \left(\frac{1}{x}\right) + \infty$$

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

$$\rightarrow \frac{x-1}{x} < 1 \rightarrow x-1 < x \rightarrow -1 < 0 \Rightarrow x < \frac{1}{x}$$

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

$$③ \quad x' < x+1 \rightarrow x' < x+1 \rightarrow x' - x < 1$$

(1, 0)

$$(x-1)'(x+1)' < 0 \rightarrow \frac{1}{x} < 0 \rightarrow x < 0$$

$$x' < x+1 \rightarrow x' < x+1 \rightarrow x' - x < 1$$

$$|x-1| < 1 \rightarrow x-1 < 1 \rightarrow x < 2$$

$$\beta = \frac{x-1}{x} = \frac{1}{x}$$

$$④ \quad \begin{array}{c|c|c|c} -1 & 0 & 1 & \\ \hline -x-1 & x+1 & x+1 & x+1 \\ \hline 1 & x+1 & x+1 & x+1 \end{array}$$

max: 1

$$min: -1$$

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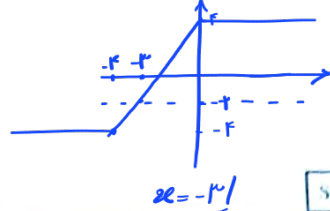
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$$y = \left| \frac{1}{r}x + r \right| - 1 = y$$

$$|u+r|-|u|=-r$$



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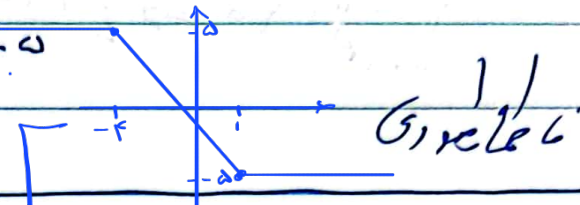
③ $y = \left| \frac{1}{r}x \right| - r$ $y' = \left| \frac{1}{r}x + r \right| - 1$

$$\left| \frac{1}{r}x \right| - r = \left| \frac{1}{r}x + r \right| - 1 \rightarrow \frac{1}{r}x + 1 + r + \epsilon a = \left| \frac{1}{r}x + 1 - r \right| \left| \frac{1}{r}x \right|$$

$$\epsilon x + 1 + r = -r \left| \frac{1}{r}x \right| \rightarrow -rx - \frac{10}{r} = \left| \frac{1}{r}x \right|$$

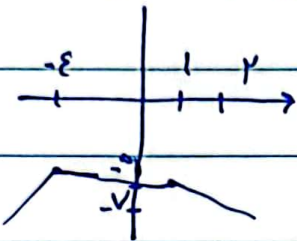
$$\frac{1}{r}x = -rx - \frac{10}{r} \rightarrow x = -10$$

$$\frac{1}{r}x = rx + \frac{10}{r} \rightarrow x = 10$$



④ ان $f(x) = [|1-x| - |x+r|]$ $R = \{a_1, \dots, F, a\}$

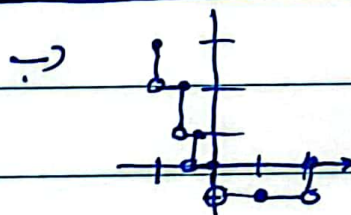
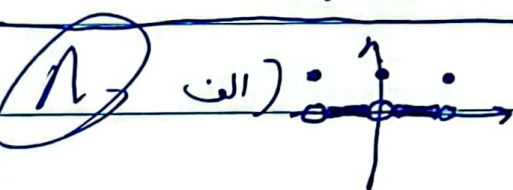
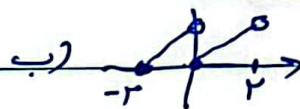
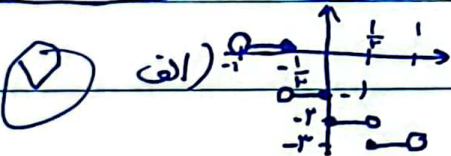
$$|x+r| = 0 \rightarrow -rx - r$$



$$\Rightarrow R = [a \in (-\infty, -\infty) | x \in \mathbb{Z}]$$

ب) $f(x) = \frac{1}{x} - \left\lfloor \frac{x+1}{x} \right\rfloor \rightarrow \frac{1}{x} - \left\lfloor \frac{1}{x} \right\rfloor$ $R = [1, r]$

$$r \rightarrow 0 \leq r < 1$$



⑤ $a \in [b], \epsilon, r$ $b \in [a], r, \epsilon$

$$\hookrightarrow a \in [0, r]$$

$$\hookrightarrow b \in [0, \epsilon]$$

$$\rightarrow [b] = 0 \rightarrow a \in [0, r] \cup \bar{0}$$

$$[b] = r \rightarrow a \in [r, 0] \cup \bar{r}$$

$$[b] = r \rightarrow a \in [r, 0] \cup \bar{r}$$

$$b \in [r, \epsilon]$$

$$a \in [1, r]$$

$$b+a = r, y$$

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10. $(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4, 19A$

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

$1 - \sqrt{2} \approx 0.0866, 1 - \sqrt{2} \approx 0.0866$

$-1 \pm 1 - \sqrt{2} \approx 0 \Rightarrow [19V, -], 19V$

19/10/2019