

تکلیف 20

19, 20

آرایی خنجرار

①

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

$$(x-1)^2 < 1 \rightarrow x^2 - 2x + 1 < 1$$

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

$$-x^2 + 2x + 1 < 0 \rightarrow \Delta = 4 - 4(-1)(1) = 8$$

$$x < 1 \rightarrow x < \frac{1}{2}$$

⑤

$$\left| \frac{2x-1}{x} \right| < 2 \rightarrow -2 < \frac{2x-1}{x} < 2$$

②

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

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

1, 1.5

$$\frac{1}{x} > x \rightarrow x < \frac{1}{x}$$

$$\left| \frac{x-2}{2x+1} \right| > 1 \rightarrow \frac{x-2}{2x+1} > 1 \rightarrow \frac{x-2}{2x+1} < -1$$

$$x-2-2x-1$$

$$-x-3$$

$$\frac{-x-3}{2x+1} > 0$$

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

$$\frac{-2}{x} < 0$$

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

Espadana

استرا

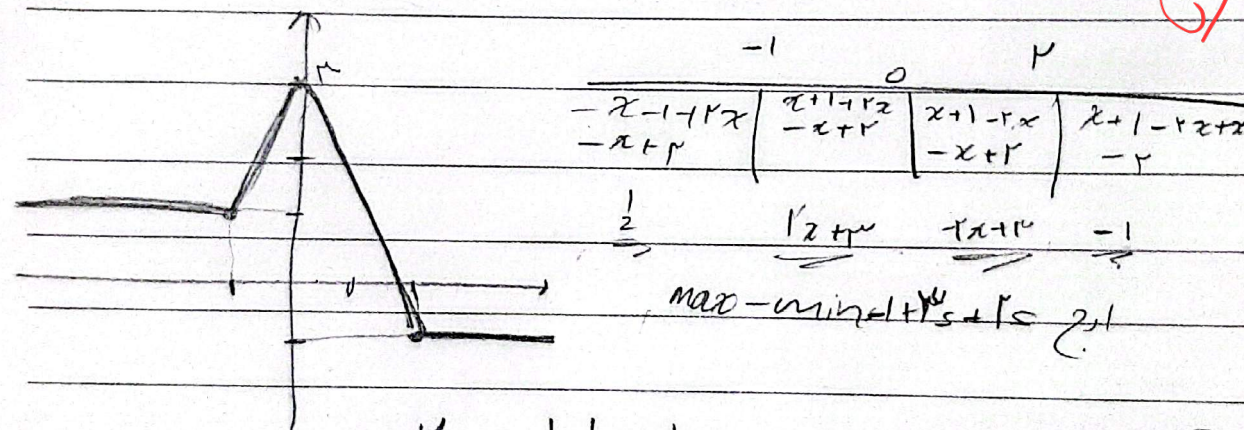
$$\left(-\frac{1}{2}, -\frac{1}{3} \right) \cup \left(\frac{1}{2}, \frac{1}{3} \right)$$

$$\Delta_{1-2} < 0$$

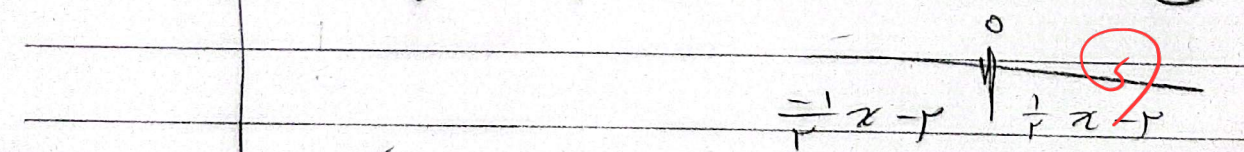
$$|x - a| < \beta \quad -\beta < x - a < \beta \xrightarrow{+a} a - \beta < x < a + \beta$$

$$\alpha + \beta = r$$
$$\alpha - \beta = -r$$
$$r\alpha = 1 \quad \alpha = \frac{1}{r}$$

$$f(x) = (x+1)(-14x) + (x-4)$$



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

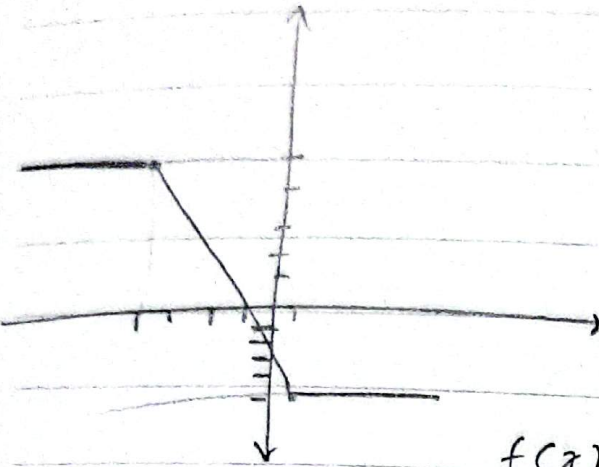


$$\frac{1}{r} x + 1 \leq -p - \frac{1}{r} z$$

$\therefore \text{Rate} \leftarrow \pi_0 - \pi$

عقدا
(سجل)
Espadana

$$\text{الف} \rightarrow [1-x + -|x+\varepsilon|]$$



$$\omega \quad \begin{array}{c} -\varepsilon \quad 1 \\ -|x-\omega| \end{array}$$

(9)

$$-\omega < 1-x - |x+\varepsilon| \leq \omega$$

$$[1-x - |x+\varepsilon|]$$

$$R_f = \{ \pm \omega, \pm \varepsilon, \pm 1, \pm 2, \pm 3, \pm 4, \dots \}$$

(1,0)

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

(1)

$$= \frac{1}{x} - \left[\frac{1}{x} \right] = 1$$

$$0 < x < 1 \rightarrow 1 < x+1 < 2$$

$$R_f = (1, 2)$$

$$R_f = [-1, 0)$$

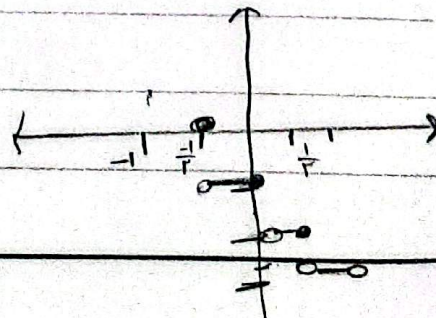
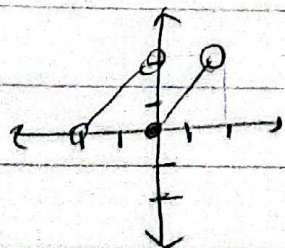
$$y = [-2x] - 1 \quad \text{الف (10)}$$

$$1) -1 < x \leq -\frac{1}{2} \rightarrow 1 < -2x \leq 2 \rightarrow [-2x] \in 1, y \in 0$$

$$2) -\frac{1}{2} < x < 0 \rightarrow 0 < -2x < 1 \rightarrow [-2x] \in 0, y \in -1$$

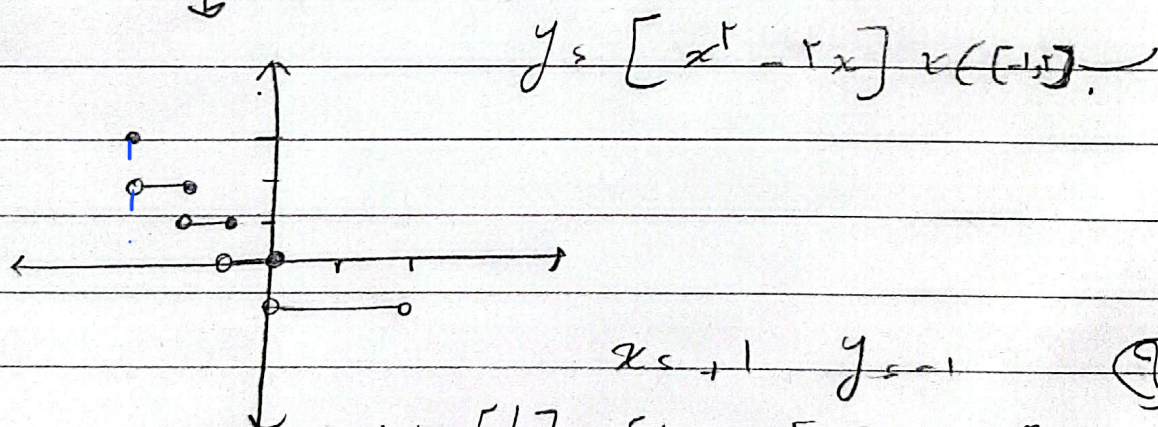
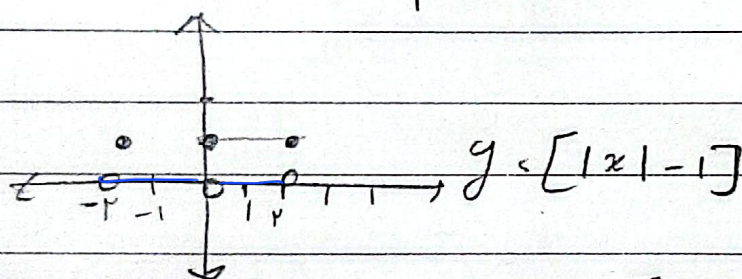
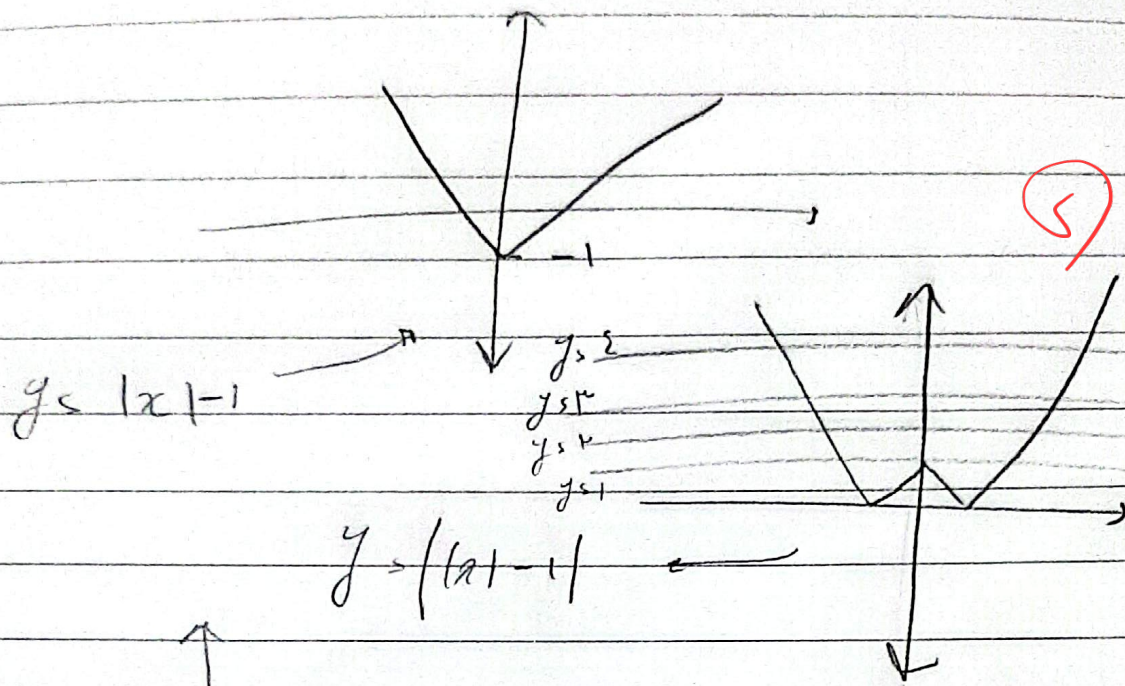
$$3) 0 < x \leq \frac{1}{2} \rightarrow -1 < -2x < 0 \rightarrow [-2x] \in -1, y \in -2$$

$$4) \frac{1}{2} < x < 1 \rightarrow -2 < -2x < -1 \rightarrow [-2x] \in -2, y \in -3$$



Espadana

iii) $y = [|x| - 1]$ $x \in [-2, 2]$ (A)



$x \in [-1, 2]$ $y \in [-1, 0]$ (9)

$a + [b] \in \mathbb{R}/\mathbb{Z}$ $[a] \in \mathbb{Z}$ $a \in m + \mathbb{Z}$

$b - [a] \in \mathbb{R}/\mathbb{Z}$ $[b] \in \mathbb{Z}$ $b \in n + \mathbb{Z}$

$\Rightarrow m + \mathbb{Z} + \mathbb{Z} \in \mathbb{Z}/\mathbb{Z}$ $m + n \in \mathbb{Z}$

$\Rightarrow n + \mathbb{Z} - m \in \mathbb{Z}/\mathbb{Z}$ $n - m \in \mathbb{Z}$

$rn \in \mathbb{Z}$ $ns \in \mathbb{Z}$

Espadana $b \in \mathbb{R}/\mathbb{Z}$ $a \in \mathbb{Z}$

$\hookrightarrow a + b \in \mathbb{R}/\mathbb{Z} + \mathbb{Z}/\mathbb{Z} \in \mathbb{Z}/\mathbb{Z}$

$$1 - \sqrt{2} < 0 \rightarrow (1 - \sqrt{2})^4 > 0$$

(10)

$$(1 + \sqrt{2})^4 \leq 198 - (1 - \sqrt{2})^4 \rightarrow$$

$$-1 < 1 - \sqrt{2} < 0 \rightarrow, -1 < (1 - \sqrt{2})^4 < 0 \rightarrow$$

$$196 < (1 + \sqrt{2})^2 < 198 \rightarrow$$

$$[(1 + \sqrt{2})^4] \leq 196 \text{ --- غلطی}$$