

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

$$t = (x-1)^2 = \pm 1 \Rightarrow x = \begin{cases} \sqrt{1} \\ 0 \text{ و } 2 \end{cases}$$

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

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

$$x^2 - 2x + 1 < 2x^2$$

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

$$\Rightarrow x > \frac{1}{2}$$

ب) $\left| \frac{x-1}{x+1} \right| > 1 \quad x \neq -\frac{1}{2}$

$$\frac{(x-1)^2}{(x+1)^2} > 1 \Rightarrow (x-1)^2 > (x+1)^2 \Rightarrow x^2 - 2x + 1 > x^2 + 2x + 1$$

$$\Rightarrow -4x > 0 \Rightarrow x < 0$$

نقطه ها: $-\frac{1}{2}, \frac{1}{2}$

علامت ها: $+, -, +$

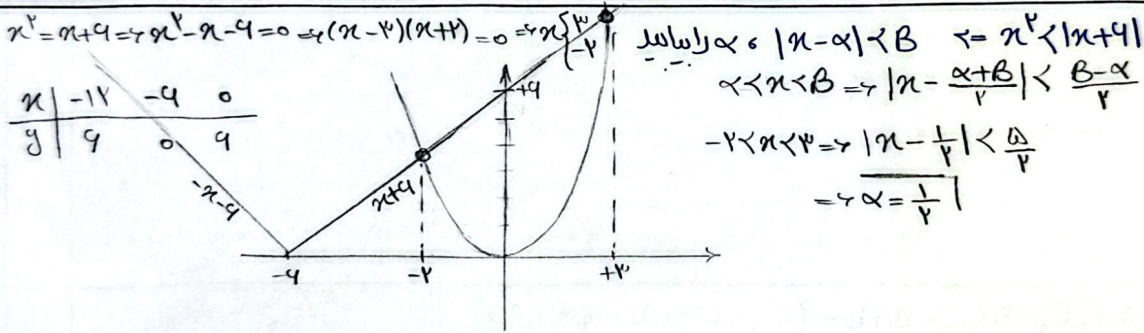
حاصل: $-\frac{1}{2} < x < \frac{1}{2}$ و $x \neq -\frac{1}{2}$

$$\Delta = 4 + 36 = 40$$

$$x = \frac{-4 \pm \sqrt{40}}{4} = \frac{-1 \pm \sqrt{10}}{2}$$

$$O_f = \left(-\frac{1}{2}, \frac{1}{2}\right) - \left\{-\frac{1}{2}\right\}$$

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مجموع بیشترین و کمترین مقادیر تابع $y = |x+1| - |2x| + |x-2|$

نقطه ها: $-1, 0, 2$

علامت ها: $+, -, +$

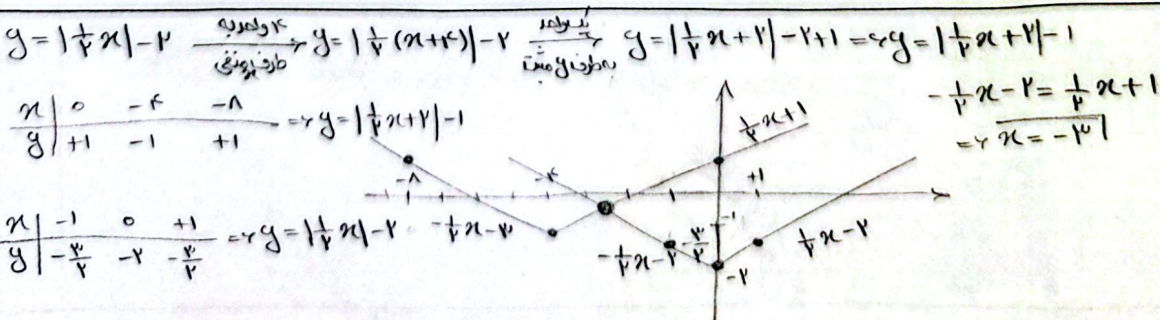
حاصل: $-1 \leq y \leq 3$

نقطه ها: $-1, 0, 2$

علامت ها: $+, -, +$

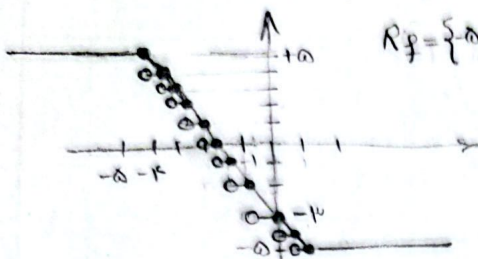
حاصل: $-1 \leq y \leq 3$

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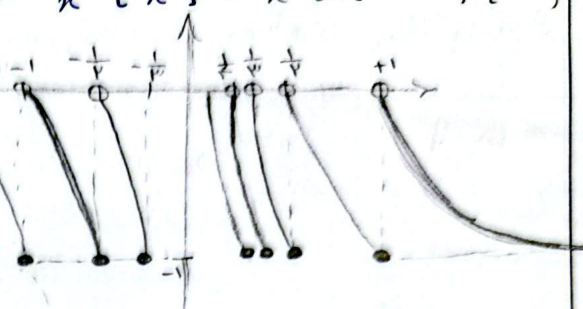


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$$\hookrightarrow +1 - (-2) = 3$$

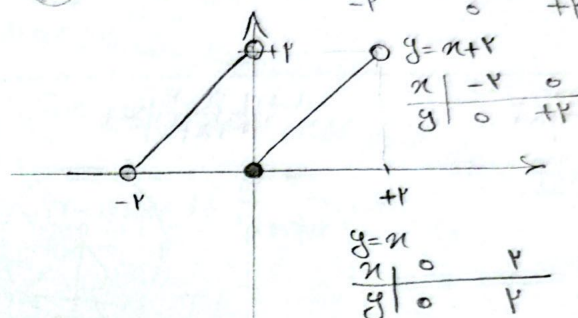
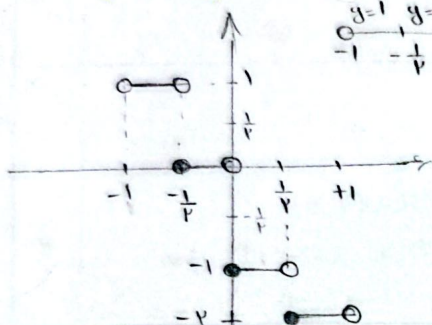


$$R_f = \{x \in \mathbb{Z} \mid x \leq 0\}$$



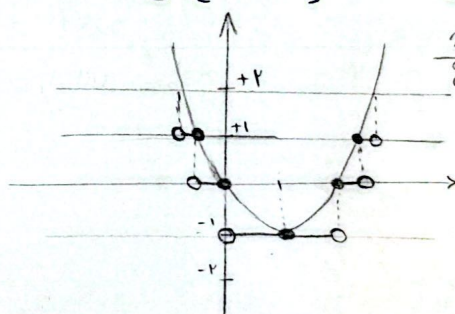
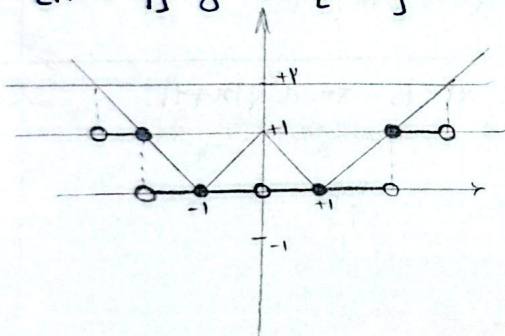
الف) $y = [-x] - 1 \quad x \in (-1, +1)$

$$b) x - y \left\lceil \frac{x}{y} \right\rceil \quad x \in (-y, y)$$



$$\text{الف) } [||x|-1|] = y \quad x \in [-2, 2]$$

$$\hookrightarrow y = [x^2 - 4x] \quad x \in [-1, 2] \quad -\frac{b}{2a} = \frac{4}{1} = 4$$



$$b - [a] = x, x, a + [b] = x, x \quad , \quad a + b = ? \quad \quad a = b \Rightarrow [a] = [b]$$

$$\begin{aligned} [b - [a]] &= [r, r] \\ [a + [b]] &= [r, r] \end{aligned} \Rightarrow \begin{cases} [b] - [a] = r \\ [a] + [b] = r \end{cases} \Rightarrow r[b] = q \Rightarrow r[b] = 0, [a] = 1$$

$$\begin{aligned} b-1 &= r, r \Rightarrow b = r, r^1 \\ a+r &= r, r \Rightarrow a = 1, r^1 \end{aligned} \Rightarrow a+b = r, r+1, r = r, 1$$

اگر $(1+\sqrt{2})^4 + (1-\sqrt{2})^4$ باشد، جزئی صحیح عدد $(1+\sqrt{2})^4$ ؟

$$\begin{aligned} & \left[(1+\sqrt{y})^4 \right] = \left[19\lambda - (1-\sqrt{y})^4 \right] \\ \Rightarrow & \left[(1+\sqrt{y})^4 \right] = 19\lambda + \left[- (1-\sqrt{y})^4 \right] = 19\lambda - 1 = 19\mu \\ & \quad \quad \quad \underbrace{\quad \quad \quad}_{\substack{\text{---} 0.1\text{e} \\ \text{---} 0.1\text{e}}} \\ & \quad \quad \quad \underbrace{\quad \quad \quad}_{\substack{\text{---} 0.1\text{e} \\ \text{---} 0.1\text{e}}} \\ & \quad \quad \quad \underbrace{\quad \quad \quad}_{\substack{\text{---} 0.1\text{e} \\ \text{---} 0.1\text{e}}} \end{aligned}$$