نام و نام خانوادگی ...[handwritten name]...... پاسخنامه تشریحی تکلیف شماره ...۲... کلاس ...یازدهم ...	
$\frac{1}{x-1} = \lvert x-1 \rvert$ $\begin{cases} x \geq 1 \to x^2 - 2x + 2 = 2 \\ x \leq 1 \to -x^2 + 2x - 2 = 2 \end{cases}$ $x^2 - 2x = 0 \to x = 0$ یا $2 \to$ ۰ در بازه نیست پس فقط ۲ $-x^2 + 2x - 2 = 0 \to \Delta < 0$ ریشه ندارد پس فقط $x=2$ و یک ریشه دارد.	۱
الف) $\left\lvert \frac{2x-1}{x} \right\rvert < 2 \to$ ① $\frac{2x-1}{x} > -2 \to \frac{4x-1}{x} > 0$ ② $\frac{2x-1}{x} < 2 \to \frac{-1}{x} < 0 \to x > 0$ اشتراک $\to x = (\frac{1}{4}, +\infty)$ ب) $\left\lvert \frac{x-2}{2x+1} \right\rvert > 1 \to$ ① $\frac{x-2}{2x+1} > 1 \to \frac{-x-3}{2x+1} > 0$ ② $\frac{x-2}{2x+1} < -1 \to \frac{3x-1}{2x+1} < 0$ اجتماع $\to x = (-3, -\frac{1}{2})$ ، $x = (-\frac{1}{2}, \frac{1}{3})$	۲
$x^2 < \lvert x+4 \rvert$ $\lvert x - \alpha \rvert < \beta$ $\begin{cases} x \geq -4 \to x^2 - x - 4 < 0 \to -2 < x < 3 \checkmark \\ x \leq -4 \to x^2 + x + 4 < 0 \to \Delta < 0 \end{cases}$ $\to -2 < x < 3 \to \alpha =$ وسط و $\beta = 3 - \alpha$ $\to = \lvert x - \frac{1}{2} \rvert < \frac{5}{2} \to \alpha = \frac{1}{2}$	۳
$y = \lvert x+1 \rvert - \lvert 2x \rvert + \lvert x-2 \rvert$ $\begin{cases} x \geq 2 \to x+1-2x+x-2 = -1 \\ 2 \geq x \geq 0 \to x+1-2x-x+2 = -2x+3 \\ 0 \geq x \geq -1 \to x+1+2x-x+2 = 2x+3 \\ -1 \geq x \to -x-1+2x-x+2 = 1 \end{cases}$ min : -1 ، max : 3 ، min : 1 ، max : 3 $\to max - min = 3 - (-1) = 4$	۴
$y = \lvert \frac{1}{2} x \rvert - 2 \to$ ۴ واحد به چپ و یک واحد به بالا $C = \frac{1}{2}\lvert x \rvert - 2 \xrightarrow{\text{۴ تا چپ}} \frac{1}{2}\lvert x+4 \rvert - 2 \xrightarrow{\text{یکی بالا}} \frac{1}{2}\lvert x+4 \rvert - 1$ $\to \frac{1}{2}\lvert x+4 \rvert - 1 = \frac{1}{2}\lvert x \rvert - 2 \to \frac{1}{2}(\lvert x+4 \rvert - \lvert x \rvert) = -1$ $\begin{cases} x \geq 0 \to x+4-x = -2 \; ✗ \\ 0 \geq x \geq -4 \to x+4+x = -2 \to x = -3 \checkmark \\ x \leq -4 \to -x-4+x = -2 \; ✗ \end{cases}$	۵

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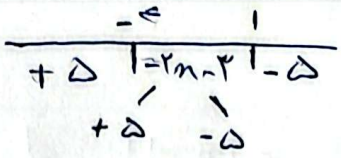
الف) $f(x) = [|1-x| - |x+2|]$



$\longrightarrow R_f = \{-5, -4, -3, \dots, 4, 5\}$

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

$\begin{cases} t \in \mathbb{Z} \longrightarrow f(x) = -1 \\ t \notin \mathbb{Z} \longrightarrow -1 < f(x) < 0 \end{cases} \longrightarrow R_f = [-1, 0)$

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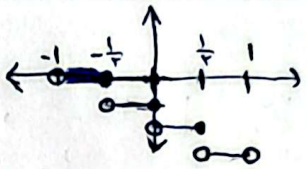
الف) $[-2x] - 1 \quad x \in (-1, 1)$

$-1 \longrightarrow 1 \quad 0 \longrightarrow -1$

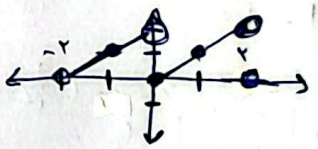
$-\frac{1}{2} \longrightarrow 0 \quad \frac{1}{2} \longrightarrow -2 \quad 1 \longrightarrow -3$



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

$-2 \longrightarrow 0 \quad 0 \longrightarrow 0 \quad 2 \longrightarrow 0$

$-1 \longrightarrow 1 \quad 1 \longrightarrow 1$



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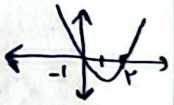
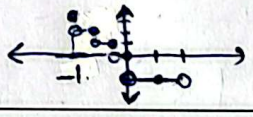
الف) $y = [||x|-1|] \longrightarrow ||x|-1| \longrightarrow$

$\longrightarrow [||x|-1|] \xrightarrow{x \in [-2,2]}$

ب) $[x^2 - 2x] \quad x \in [-1, 2] \longrightarrow x^2 - 2x \longrightarrow$



$\longrightarrow [x^2 - 2x] \xrightarrow{x \in [-1,2]}$



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$a + [b] = 4,2 \qquad b - [a] = 2,4$

$\begin{cases} a \text{ اعشار} = 0,2 \\ b \text{ اعشار} = 0,4 \end{cases} \longrightarrow \begin{aligned} a + b &= 4,2 + 0,4 = 4,6 \\ b - a &= 2,4 - 0,2 = 2,2 \end{aligned}$

$\longrightarrow b = 3,4 \quad , \quad a = 1,2$

$a + b = 4,6$

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$(1+\sqrt{2})^6 + (1-\sqrt{2})^6 = 198$

$\longrightarrow 1 - \sqrt{2} \simeq -0,4 \longrightarrow 0 < (1-\sqrt{2})^6 < 1$

$\longrightarrow (1+\sqrt{2})^6 = 198 - (1-\sqrt{2})^6 = 197,\dots$

$\longrightarrow [(1+\sqrt{2})^6] = 197$