

$$y = \left| \frac{1}{x} \right| - 2 \xrightarrow[\text{x کی منفی}]{\text{یک واحد به طرف چپ}} \frac{1}{x+4} - 2 \xrightarrow[\text{y کی مثبت}]{\text{یک واحد به طرف چپ}} \frac{1}{x+4} - 1$$

$$\frac{1}{x+4} - 1 = \left| \frac{1}{x} \right| - 2 \Rightarrow x = -3$$

الف) $\{ \text{رشته} \} = 1, -4$

if $x \geq 1 \Rightarrow f(x) = 0$

if $-4 \leq x < 1 \Rightarrow f(x) = -2x - 2$

if $x < -4 \Rightarrow f(x) = 0$

$x = -4 \Rightarrow f = 0 \Rightarrow -0 < f < 0$
 $x = 1 \Rightarrow f = -2$
 $\Rightarrow R_f = [-2, 0]$

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

$0 \leq \frac{1}{x} < 1 \Rightarrow -1 \leq f(x) < 0 \Rightarrow R_f = [-1, 0]$

$$\left. \begin{aligned} a + [b] &= 4, 2 \Rightarrow [a] + [b] = 4 \\ b - [a] &= 2, 4 \Rightarrow [b] - [a] = 2 \end{aligned} \right\} \Rightarrow [b] = 3 \Rightarrow [a] = 1$$

$$\Rightarrow b - 1 = 2, 4 \Rightarrow b = 3, 5 \Rightarrow a + b = 1, 2 + 3, 4 = [4, 6]$$

$$a + 3 = 4, 2 \Rightarrow a = 1, 2$$

$1 - \sqrt{2} = -(\sqrt{2} - 1)$ $|1 - \sqrt{2}| < 1 \Rightarrow (1 - \sqrt{2})^4 \approx 0,002$
 $(1 - \sqrt{2})(1 + \sqrt{2}) = 1 - 2 = -1$
 $(1 + \sqrt{2})^4 + (1 - \sqrt{2})^4 = 198$
 $\Rightarrow (1 + \sqrt{2})^4 \approx 198 - 0,002 = 197,998$

$$\Rightarrow [197,998] = [198]$$