

یک ریشه

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

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

$$x-1 = \frac{-1}{x-1} \Rightarrow (x-1)^2 = -1 \Rightarrow x^2 - 2x + 1 = -1 \Rightarrow x^2 - 2x + 2 = 0 \Rightarrow \Delta < 0 \Rightarrow \text{ریشه ندارد}$$

$$-2 < \frac{x-1}{x} < 2 \Rightarrow -2x < x-1 < 2x \Rightarrow \begin{cases} x-1 < 2x \Rightarrow x > -\frac{1}{x} \\ -2x < x-1 \Rightarrow x < \frac{1}{x} \end{cases} \Rightarrow \left(-\frac{1}{x}, \frac{1}{x} \right)$$

$$\frac{x-2}{x+1} > 1 \Rightarrow x-2 > x+1 \Rightarrow -3 > 1 \Rightarrow \text{ریشه ندارد}$$

$$\Rightarrow (-\infty, -3) \cup (-\infty, \frac{1}{x})$$

$$\frac{x-2}{x+1} < -1 \Rightarrow x-2 < -x-1 \Rightarrow 2x < 1 \Rightarrow x < \frac{1}{2} \Rightarrow (-\infty, \frac{1}{2})$$

$$|x+4| > x^2 \Rightarrow x+4 > x^2 \Rightarrow x^2 - x - 4 < 0 \Rightarrow \Delta = 17 \Rightarrow x = \frac{1 \pm \sqrt{17}}{2} \Rightarrow (-2, 3)$$

$$x+4 < x^2 \Rightarrow x^2 - x - 4 < 0 \Rightarrow \Delta < 0 \Rightarrow \text{ریشه ندارد}$$

$$\begin{cases} x-2 < 3 \\ x-2 < -3 \end{cases} \Rightarrow \begin{cases} x < 5 \\ x < -1 \end{cases} \Rightarrow x < -1 \Rightarrow \begin{cases} x+3 = 3 \\ x-3 = -2 \end{cases} \Rightarrow \begin{cases} x = 0 \\ x = 1 \end{cases}$$

$$\frac{x-1}{y} = \frac{2}{3} \Rightarrow 3(x-1) = 2y \Rightarrow 3x-3 = 2y \Rightarrow 3x = 2y+3 \Rightarrow x = \frac{2y+3}{3}$$

$$|2x-2| > |2x+1| \Rightarrow 2x^2 + 1x - 3 < 0 \Rightarrow -3 < x < \frac{1}{2}, x \neq -\frac{1}{2}$$

$$\text{معادله جدید} \Rightarrow y = \left| \frac{1}{y}(2+4) \right| - 2 + 1 \Rightarrow y = \left| \frac{2}{y} + 2 \right| - 1$$

$$y = \left| \frac{1}{y}x \right| - 2$$

$$\left| \frac{x}{y} + 2 \right| - 1 = \left| \frac{x}{y} \right| - 2 \Rightarrow -\left| \frac{x}{y} + 2 \right| + \left| \frac{x}{y} \right| = 1 \Rightarrow -|b+2| + |b| = 1 \Rightarrow \begin{cases} b > 0 \\ b < 0 \end{cases}$$

$$b^2 + b^2 + 4 + 4b - 2b^2 - 2b = 1 \Rightarrow 2b + 6 = 1 \Rightarrow 2b = -5 \Rightarrow b = -\frac{5}{2} \Rightarrow x = -3$$

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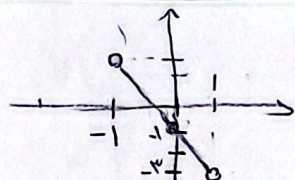
$1-x > 0 \Rightarrow x < 1 \Rightarrow R = (-\infty, 1)$, $x+f > 0 \Rightarrow x > -f \Rightarrow R = (-\infty, -f)$
 $\Rightarrow \cap R = (-\infty, -f)$

$R_f = \{-\infty, -f, -f-1, \dots, f, \infty\}$

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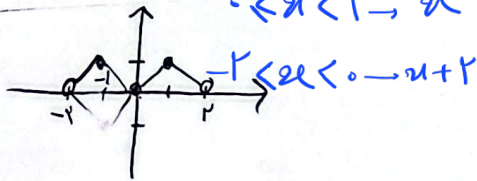
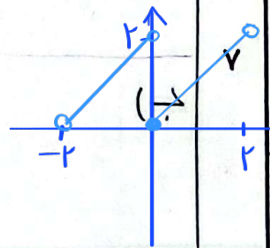
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$\Rightarrow \frac{1}{x} - \left[\frac{x}{x} + \frac{1}{x} \right] \Rightarrow \frac{1}{x} - \left[\frac{1}{x} \right] \Rightarrow \frac{1}{x} - \left[\frac{1}{x} \right] < 1 \Rightarrow \left[\frac{1}{x} - \left[\frac{1}{x} \right] + 1 \right] < 2$
 $[1, 2) \quad [-1, 0)$

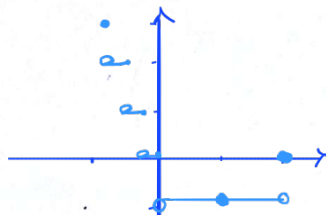
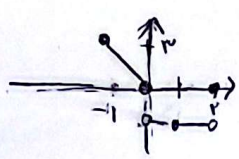
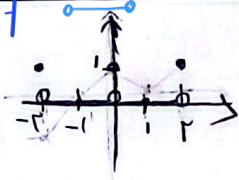


$y = [x] - 1$ $-1 < x < 0 \Rightarrow x - 1 = y$
 $0 \leq x < 1 \Rightarrow y = -1$

الف



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



الف

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ب

$\begin{cases} [a] + [b] = f \\ [b] - [a] = 2 \end{cases} \Rightarrow \begin{cases} 2[b] = 4 \Rightarrow [b] = 2 \Rightarrow b = 2, 3 \\ [a] = 1 \Rightarrow a = 1, 2 \end{cases} \Rightarrow a + b = f, 4$

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$(1+\sqrt{2})^4 = 19\sqrt{2} - (1-\sqrt{2})^4$

$[(1+\sqrt{2})^4] = [19\sqrt{2} - (1-\sqrt{2})^4] \Rightarrow [(1+\sqrt{2})^4] = 19\sqrt{2} - [(1-\sqrt{2})^4] \Rightarrow [(1+\sqrt{2})^4] = 19\sqrt{2}$

1, 0

$0 < (1-\sqrt{2})^4 < 1$
 $[(1+\sqrt{2})^4] = [19\sqrt{2} - (1-\sqrt{2})^4]$
 $= [(1+\sqrt{2})^4] = 19\sqrt{2} - [(1-\sqrt{2})^4] = 19\sqrt{2} - 1 = 19\sqrt{2}$