

$$y x^2 - y - 3x^2 + 4 \rightarrow x^2(y-3) \geq y$$

$$x^2 \frac{4+y}{y-3} \rightarrow |x| \geq \sqrt{\frac{4+y}{y-3}} \rightarrow \frac{4+y}{y-3} \geq 0$$

$$\frac{-4}{+1} - \frac{3}{-3} \rightarrow R_{P_1}(-\infty, -4] \cup (3, +\infty)$$

$$x^2 \geq 0 \rightarrow \frac{4}{-1} \leq -4 \rightarrow (-\infty, -4] \cup (3, +\infty)$$

$$x^2, \infty^2 \rightarrow 3$$

$$y x^2 + 3y - 2x - 1 \rightarrow x^2(y-2) + 3y - 1$$

$$x^2 \frac{3y-1}{y-2} \rightarrow -1 \leq \frac{3y-1}{y-2} \leq 1$$

$\underbrace{\frac{3y-1}{y-2}}_{\substack{y-2 \leq 3y-1 \quad 3y-1 \leq y-2 \\ \frac{3}{2} \leq y \quad y \leq \frac{1}{2}}}$

$$\Rightarrow R_{P_1}[-\frac{3}{2}, \frac{1}{2}]$$

$$x^2 \geq -1 \rightarrow \frac{3}{2} \rightarrow [-\frac{3}{2}, \frac{1}{2}]$$

$$x^2 \geq 1 \rightarrow \frac{1}{2}$$

در اینجا دنبال و فنجول، قبل از وقت صفر نشانی

$$D_{P_1} \cap P \rightarrow$$

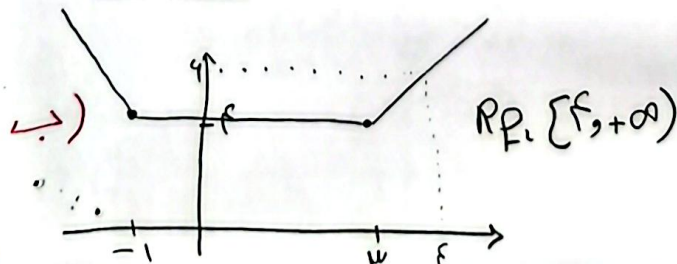
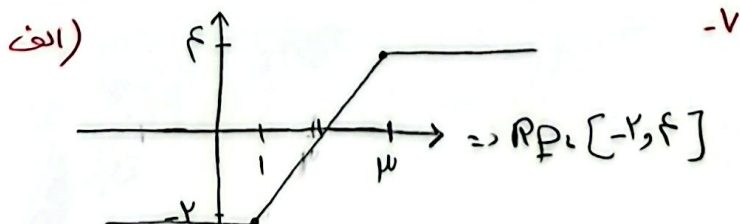
$$y x^2 - y x + y = x^2 - x + \frac{1}{x}$$

$$\rightarrow x^2(1-y) + x(-1+y) + \frac{1}{x} - y$$

$$\Delta \geq 0 \rightarrow (y-1)^2 - 4(1-y)(\frac{1}{x} - y) \geq 0 \quad R_{P_1}[0, 1]$$

$$y^2 + 1 - 2y - 1 + 4y + y - 4y^2 \geq 0 \quad \uparrow$$

$$3y^2 - 3y \leq 0 \rightarrow 3y(y-1) \leq 0 \quad \frac{0}{+1} - \frac{1}{+}$$



$$x y - y = x^2 + x + 1 \rightarrow x^2 + x - x y + y + 1 = 0$$

$$x^2 + x(1-y) + y + 1 = 0$$

$$x = \frac{y-1 \pm \sqrt{(1-y)^2 - 4(y+1)}}{2} \rightarrow (1-y)^2 - 4(y+1) \geq 0$$

$$1 + y^2 - 2y - 4y - 4 \geq 0 \rightarrow y^2 - 6y - 3 \geq 0$$

$$(y-3)(y+1) \geq 0 \quad \frac{-1}{+1} - \frac{3}{+}$$

$$\Rightarrow R_{P_1}(-\infty, -1] \cup [3, +\infty)$$

الف) ext $\left| \frac{0}{x} \right|$

$$x \times \frac{0}{14} - \frac{0}{x} + 1 \rightarrow \frac{-14}{x}$$

$$\Rightarrow R_{P_1}[-\frac{14}{x}, +\infty)$$

ب) ext $\left| \frac{-4}{x} \right|$

$$-4 + 18 - 0 = 14 \rightarrow R_{P_1}[0, 2]$$

ج) $R_{P_1}[0, +\infty)$

د) $R_{P_1} \cap P$

الف) $R_{P_1} \cap P - \left\{ \frac{3}{2} \right\}$

ب) $R_{P_1}[0, +\infty) - \{2\}$

ج) $\sqrt{x^2+3} + \frac{1}{\sqrt{x^2+3}} \rightarrow \min x = 0$

$$2\sqrt{3} + \frac{1}{\sqrt{3}} = \frac{6}{\sqrt{3}} \Rightarrow R_{P_1}\left[\frac{6}{\sqrt{3}}, +\infty\right)$$

د) $x^2 + 6 + \frac{1}{x^2 + 6} - 6 \rightarrow \min x = 0 \rightarrow 6 + \frac{1}{6} - 6$

ه) $R_{P_1}\left[\frac{1}{6}, +\infty\right)$

الف) $L_{x=1} \rightarrow 1$

$L_{x=-1} \rightarrow 3$

$L_{x=\frac{b}{a}} \rightarrow \frac{1}{p} \rightarrow x = \frac{1}{p} \sim \frac{p}{f}$

$\Rightarrow \text{Rf. } [\frac{p}{f}, p]$

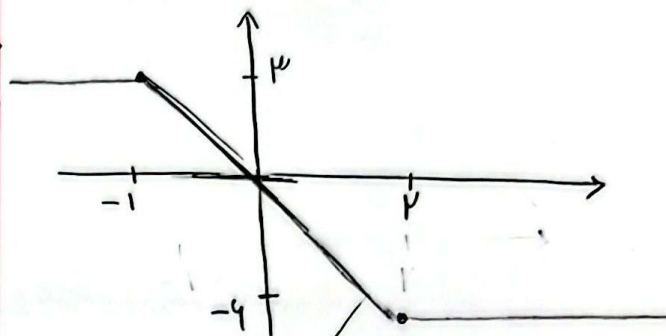
ب) $L_{x=0}^p \rightarrow 1$

$L_{x=1}^p \rightarrow 3 \Rightarrow \text{Rf. } [1, 3]$

$L_{x=-\frac{1}{p}}^p \rightarrow x$

10 $y = |x-2| - |x+2|$

-1

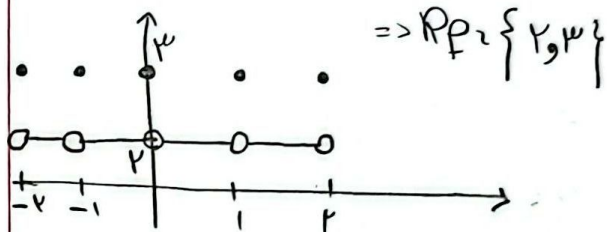


$x-2-x-2 \rightarrow -4$

$-4x \leq 1 \rightarrow x \geq -\frac{1}{4} \Rightarrow x \in [-\frac{1}{4}, +\infty)$

الف) $y = \begin{cases} x+1 & x \in [-1, 1] \\ -x & x \in [1, 2] \end{cases}$

-9



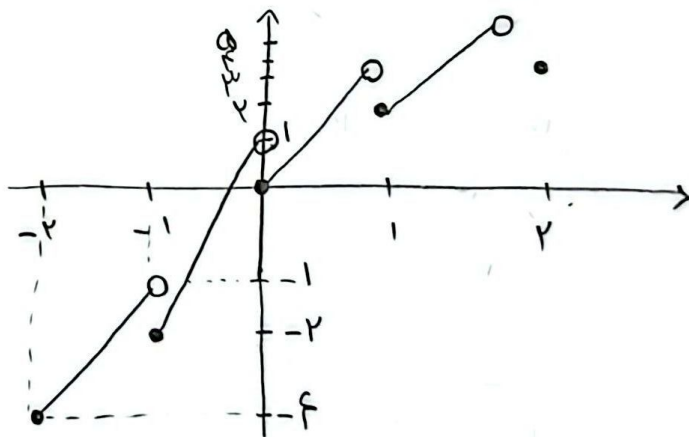
ب) $-1 \leq x \leq 1 \rightarrow [x] = -1 \rightarrow p_{x+1}$

$-1 \leq x \leq 0 \rightarrow [x] = -1 \rightarrow p_{x+1}$

$0 \leq x \leq 1 \rightarrow [x] = 0 \rightarrow p_x$

$1 \leq x \leq 2 \rightarrow [x] = 1 \rightarrow p_{x-1}$

$x \geq 2 \rightarrow [x] = 2 \rightarrow p_{x-2}$



$\text{Rf. } [-1, \infty)$