

الف) $y|x| - 2y = |x| + 1 \rightarrow |x|(y-1) = 2y+1 \rightarrow |x| = \frac{2y+1}{y-1} \rightarrow \frac{-\frac{1}{2} + 1}{\frac{1}{2} - 1 + 1}$
 $\rightarrow R_f = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$

ب) $y = \frac{|x|^2 + 1}{|x|} \Rightarrow y = |x| + \frac{1}{|x|} \rightarrow [2, +\infty)$

۲ $y|x| + y = x^2 + 2x - 2 \rightarrow x^2 + x(2-y) - 2 - 2y = 0$

$\rightarrow x = \frac{y-2 \pm \sqrt{(2-y)^2 - 4(-2-2y)}}{2} \rightarrow \frac{(2-y)^2 - 4(-2-2y)}{4} \geq 0$
 $\rightarrow \frac{4 - 4y + y^2 + 8 + 8y}{4} \geq 0 \rightarrow y^2 + 4y + 12 \geq 0$
 $\rightarrow \frac{-4 \pm \sqrt{16-48}}{2} \rightarrow (-\infty, -4] \cup [-2, +\infty)$

۳ $y|x|^2 - y|x| + y = x^2 - 2 + \frac{1}{x} \rightarrow x^2(y-1) + x(1-y) + y - \frac{1}{x} = 0 \Rightarrow (Ly)^2 - f(y - \frac{1}{x})(y-1) \geq 0$

$\rightarrow |1 + y^2 - 2y - 4y^2 + 4y - 1| \geq 0 \rightarrow -3y^2 + 3y \geq 0 \rightarrow 3y(-y+1) \geq 0 \rightarrow \frac{0}{-1+1} = 0$
 $\Rightarrow R_f = [0, 1)$ اگر چه قدر کلیه دست می شود

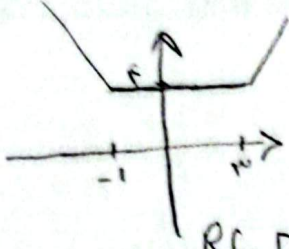
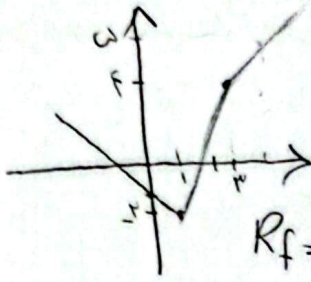
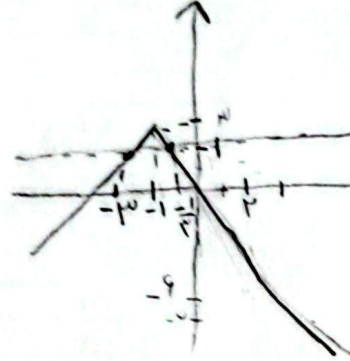
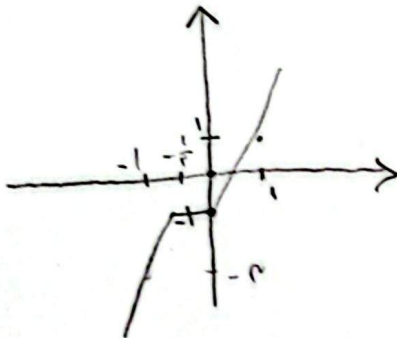
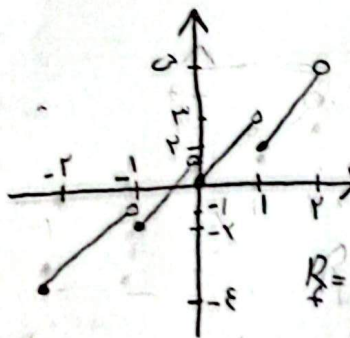
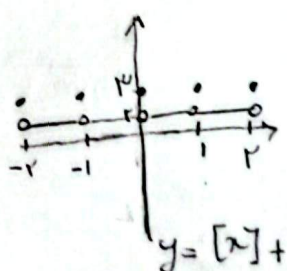
$x^2 - x + 1 \neq 0 \xrightarrow{\Delta < 0} \text{دوره} \rightarrow D_f = \mathbb{R}$

الف) $x_0 = -\frac{b}{2a} = 2 \rightarrow y_0 = 2 \rightarrow \frac{1}{y} \rightarrow R_f = [0, \sqrt{3}]$

ب) $\text{ضرب در مخرج} \rightarrow \text{در صورت} \rightarrow \text{در صورت} \rightarrow x_0 = -\frac{b}{2a} = 2 \rightarrow y_0 = -1 \rightarrow [-1, +\infty)$

الف) $R_f = (-\infty, +\infty)$

ب) $\frac{x^2+1}{x} = x + \frac{1}{x} \rightarrow [2, +\infty) \cup (-\infty, -2]$ و با $[1, +\infty)$
 بدلیل آنکه و با می تواند منفی باشد

 (ب) $R_f = [1, +\infty)$	 (الف) $R_f = [-1, +\infty)$	٦
	$y=1 \xrightarrow{x < -1} 1-x+1-x+1=1$ $\rightarrow x+1=1 \rightarrow x=-1$ $y=1 \xrightarrow{-1 < x < 1} 1-x-1-x-1=-x=1$ $\rightarrow x=-1$ $\rightarrow (-\infty, 1/2] \cup [-1/2, +\infty)$	٧
	$R_f = \mathbb{R}$	٨
 (ب) $R_f = [-1, 1)$	 (الف) $R_f = \{1, 3\}$ $y = [x] + [-x] + 1$	٩
$\sin x \xrightarrow{1-1+1=1} 1$ $\xrightarrow{1+1+1=3} 3 \rightarrow R_f = [1, 3]$ $\sin x \xrightarrow{1} 1 \rightarrow 3$ $\xrightarrow{1+1+1=3} 3 \rightarrow R_f = [1, 3]$ $\xrightarrow{1} 1 \rightarrow 3$ $\xrightarrow{1+1+1=3} 3 \rightarrow 1$	(الف) (ب)	١٠