

الف) $\frac{x+1}{x+2}$ $\xrightarrow{+ \infty}$ $\frac{\infty}{\infty} = 1$ $\xrightarrow{0}$ $\frac{1}{2}$

$|x| = 2$

$R_f = [\frac{1}{2}, 1)$

ب) $x = 0$ $\rightarrow$ $R_1 = (-\infty, 0] \cup [2, +\infty)$

$x > 0 \rightarrow \frac{x^2+1}{x} = x + \frac{1}{x}$

$x < 0 \rightarrow \frac{x^2+1}{-x} = -x + \frac{1}{-x} \rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$

$\Rightarrow R_T = (-\infty, -2] \cup [2, +\infty)$

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$y = \frac{x^2+12x-2}{x+3}$ $\xrightarrow{\text{درجه صورت نیست}}$ $y(x+3) = x^2+12x-2 \rightarrow x^2+(3-y)x-2-3y=0$

$\frac{-(3-y) \pm \sqrt{(3-y)^2+4(2+3y)}}{2} \geq 0$

$R_f = \mathbb{R} - (-9, -2)$

$y^2+12y+12 \geq 0$
 $(y+2)(y+6) \geq 0$
 $\frac{-6}{+} \frac{-2}{-}$

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

$R_f = ? \rightarrow y = \frac{x^2-x+\frac{1}{x}}{x^2-x+1}$ $\xrightarrow{\text{درجه صورت و مخرج برابر است}}$ $(1-y)x^2-(1-y)x+\frac{1}{x}-y=0$

$\sqrt{\Delta} \geq 0 \rightarrow 1+y^2-2y-4y^2-1+4y = -3y^2+2y \geq 0 \rightarrow \frac{0}{-3} \frac{1}{2} \rightarrow R_f = [0, 1] - \{1\} = [0, 1)$

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الف) $\frac{-b}{2a} = \frac{-4}{2} = -2$ $\xrightarrow{a < 0} R_f = \sqrt{(-\infty, 3]} = [-\infty, 3]$

ب) $\frac{-b}{2a} = \frac{1}{2} = 0.5$ $\xrightarrow{a > 0} R_f = \sqrt{[1, +\infty)} = [2, +\infty)$

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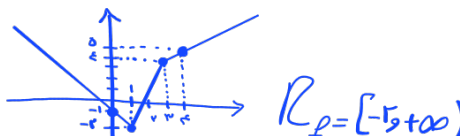
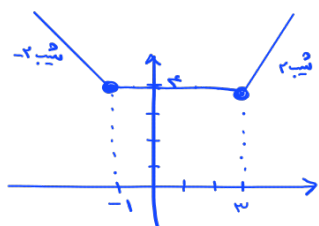
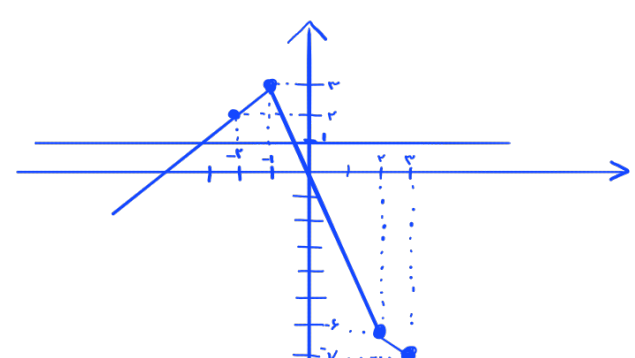
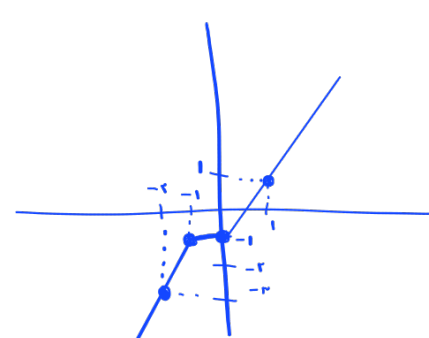
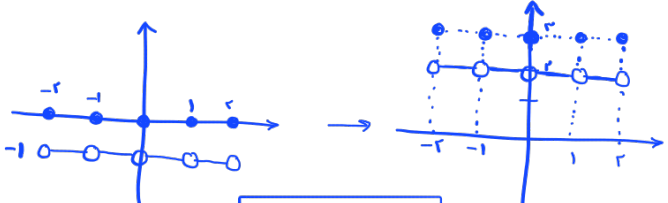
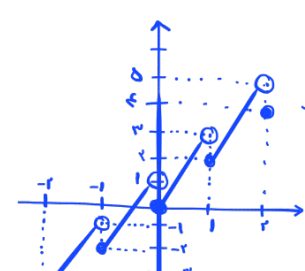
الف) $x^2-x+1 \rightarrow R = \mathbb{R}$

$\log^{(-\infty, +\infty)} = \log^{(0, +\infty)} \rightarrow R_f = (-\infty, +\infty)$

ب) $x + \frac{1}{x} \rightarrow R = (-\infty, -2] \cup [2, +\infty)$

$\log^R = \log_r^{[2, +\infty)} = [1, +\infty) = R_f$

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الف) $y = x-2 - x-3 \rightarrow$ رسمها $1, 3$ $\begin{vmatrix} 0 & 1 & 3 & 4 \\ -1 & -2 & 1 & 5 \end{vmatrix}$  $R_f = [-5, +\infty)$	ب) $x-3 + x+1$ نقطه تفرس رسم بلدانی 	۶
$y = x-2 - 2x+2$ $\begin{vmatrix} -2 & -1 & 2 & 3 \\ 2 & 3 & -6 & -1 \end{vmatrix}$  $x-2 - 2x+2 \leq 1$ $(-\infty, 1]$	۷	
$y = 2x - 2x+1 + x$ $\begin{vmatrix} -1 & -\frac{1}{2} & 0 & 1 \\ -3 & -1 & -1 & 1 \end{vmatrix}$  $R_f = \mathbb{R}$	۸	
الف) $[x] + [3-x] = [x] + [-x] + 3$  $R_f = \{2, 3\}$	ب) $3x - [x]$  $R_f = [-5, 5)$	۹
الف) $\sin^2 x - \sin x + 1$ $\sin x = \square$ $1 \rightarrow 1 - 1 + 1 = 1$ $-1 \rightarrow 1 + 1 + 1 = 3$ $\frac{1}{\sqrt{2}} = \frac{1}{2} \checkmark \rightarrow \frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} + \frac{1}{2} = \frac{1}{2}$ $R_f = [\frac{1}{2}, 3]$	ب) $\frac{\sin^2 x}{\square} + \frac{\sin^2 x}{\square} + 1$ $R_f = [1, 3]$ $\sin x = \square$ $1 \rightarrow 3$ $0 \rightarrow 1$ $-\frac{1}{2} \times$	۱۰