

الف) $[R - \frac{1}{2}] \Rightarrow [R - \frac{1}{2}] = R_f$

$\therefore a + \frac{1}{a} > 0 \rightarrow R_f = [r, +\infty)$

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

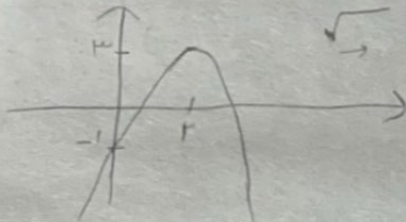
$\hookrightarrow x = \frac{y-2 \pm \sqrt{y^2 - 4y + 4 + 4y + 8}}{2} \rightarrow y^2 + 4y + 12 \geq 0$

$R_f = (-\infty, -4] \cup [-2, +\infty)$

$(y+4)(y+2) \geq 0 \rightarrow \begin{matrix} -4 & -2 \\ + & - & + \end{matrix}$

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

الف)



$R_f = [-1, 3]$

$\therefore R = R_f$

الف)

$x^3 - x + 18 > 0 \rightarrow (?)$

$\therefore$

$\frac{x^3 + 1}{x} > 0 \rightarrow \begin{matrix} 0 \\ - & + \end{matrix}$

$x = 0, \dots, -1$

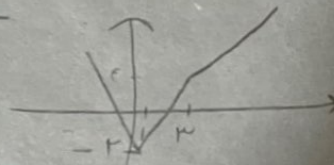
$\frac{1}{x - (-1)} = +\infty$

$x^3 = 1 \rightarrow x = 1$

$R_f = [-1, +\infty)$

الف)

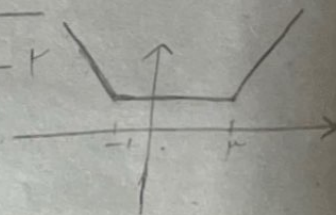
$\frac{1}{-x-1} \mid \frac{x}{x^2-4} \mid x+1$



$R_f = [-1, +\infty)$

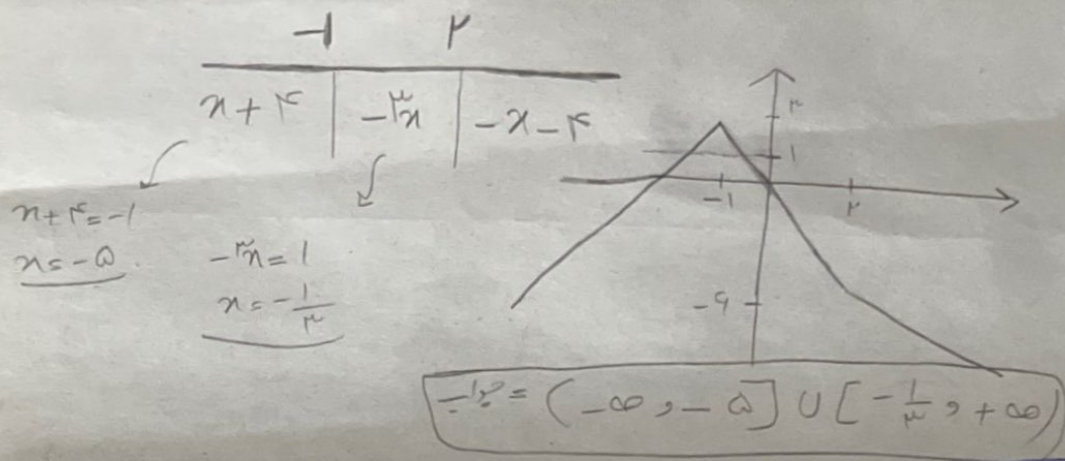
$\therefore$

$\frac{-1}{-x+2} \mid \frac{x}{x^2-4} \mid \frac{x}{x-2}$

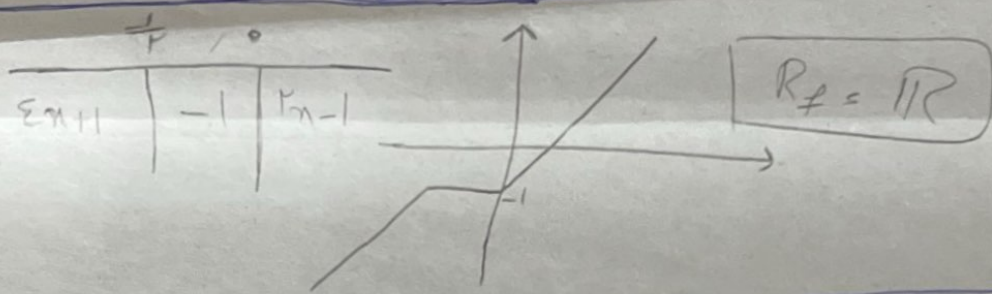


$R_f = [-1, +\infty)$

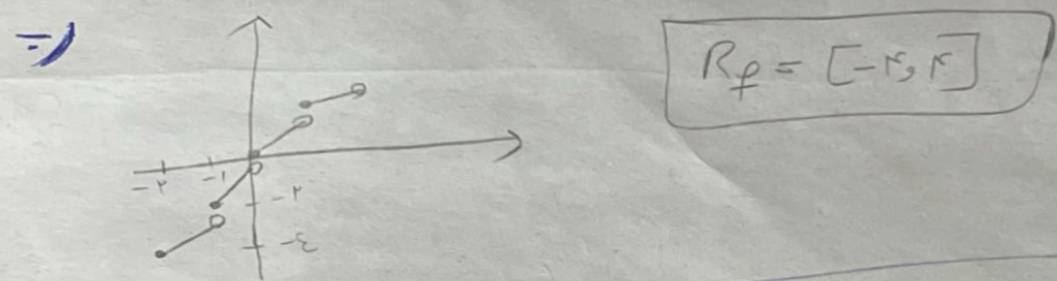
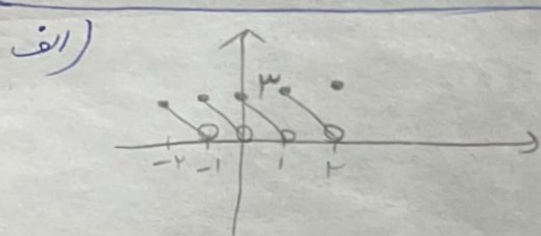
٧



٨



٩



١٠

