

۵۴/۷/۱۸

تکلیف ۹

همه جمع A

سارینا زارع

الف) $y = x^2 - 5 \rightarrow x^2 = y + 5 \rightarrow x = \sqrt{y + 5} \quad R_f = [-5, +\infty)$

①

ب) $y = x^3 + 1 \rightarrow x^3 = y - 1 \rightarrow x = \sqrt[3]{y - 1} \rightarrow R_f = \mathbb{R}$

الف) $y = x^2 - 2x + 9 \rightarrow x - 1 = \sqrt{y - 2} \rightarrow R_f = [2, +\infty)$
 $x(x - 2) \rightarrow (x - 1)^2 - 1 + 9$

②

ب) $y = x^2 - 2x + 1 \rightarrow (x - 1)^2 - 1 + 1 \rightarrow x - 1 = \sqrt{y} \rightarrow R_f = [0, +\infty)$
 $x(x - 2) \rightarrow (x - 1)^2 - 1 + 1$

الف) $y = \frac{x^2 + 3}{x^2 - 2} \rightarrow y(x^2 - 2) = x^2 + 3 \rightarrow x^2(y - 1) = y + 3$
 $x = \sqrt{\frac{y + 3}{y - 1}} \quad \begin{matrix} -3 & 1 \\ y & -y + 3 \end{matrix}$
 $R_f = (-\infty, \frac{3}{4}] \cup (1, +\infty)$

③

ب) $y = \frac{2|x| + 1}{|x| - 4} \rightarrow y(|x| - 4) = 2|x| + 1$
 $|x|(y - 2) = 1 + 4y$
 $|x| = \frac{1 + 4y}{y - 2} \quad \begin{matrix} -1 & 4 \\ y & -y + 2 \end{matrix}$
 $R_f = (-\infty, -\frac{1}{4}] \cup (2, +\infty)$

$y = \frac{1}{x^2 - 4} \rightarrow R_f = \mathbb{R} - \{0\}$
 $\frac{1}{y} = x(x - 4) \rightarrow y \neq 0$

④

الف) $y = x^2 - 9x + 2 \quad \min \left| \frac{y}{x} = 3 \right| \quad R_f = [-7, +\infty)$
 $9 + (-18) + 2 = -7$

⑤

ب) $y = -x^2 + 4x + 2 \quad \max \left| \frac{-y}{x} = 2 \right| \quad R_f = (-\infty, 6]$
 $-4 + 8 + 2 = 6$

الف) $y = \sqrt{x^2 - 4x + 2} \quad \min \left| \frac{y}{x} = 3 \right| \rightarrow R_f = [0, +\infty)$
 -4

⑥

ب) $y = \sqrt{-x^2 + 4x + 10} \quad \max \left| \frac{-y}{x} = 2 \right| \rightarrow R_f = [0, \sqrt{14}]$
 $14 = -4 + 8 + 10$

الف) $y = x^3 + 3x^2 + 2x + 1 \rightarrow R_f = \mathbb{R}$ چون بیشترین توان چند جمله ای در راست $\sqrt[3]{}$

⑦

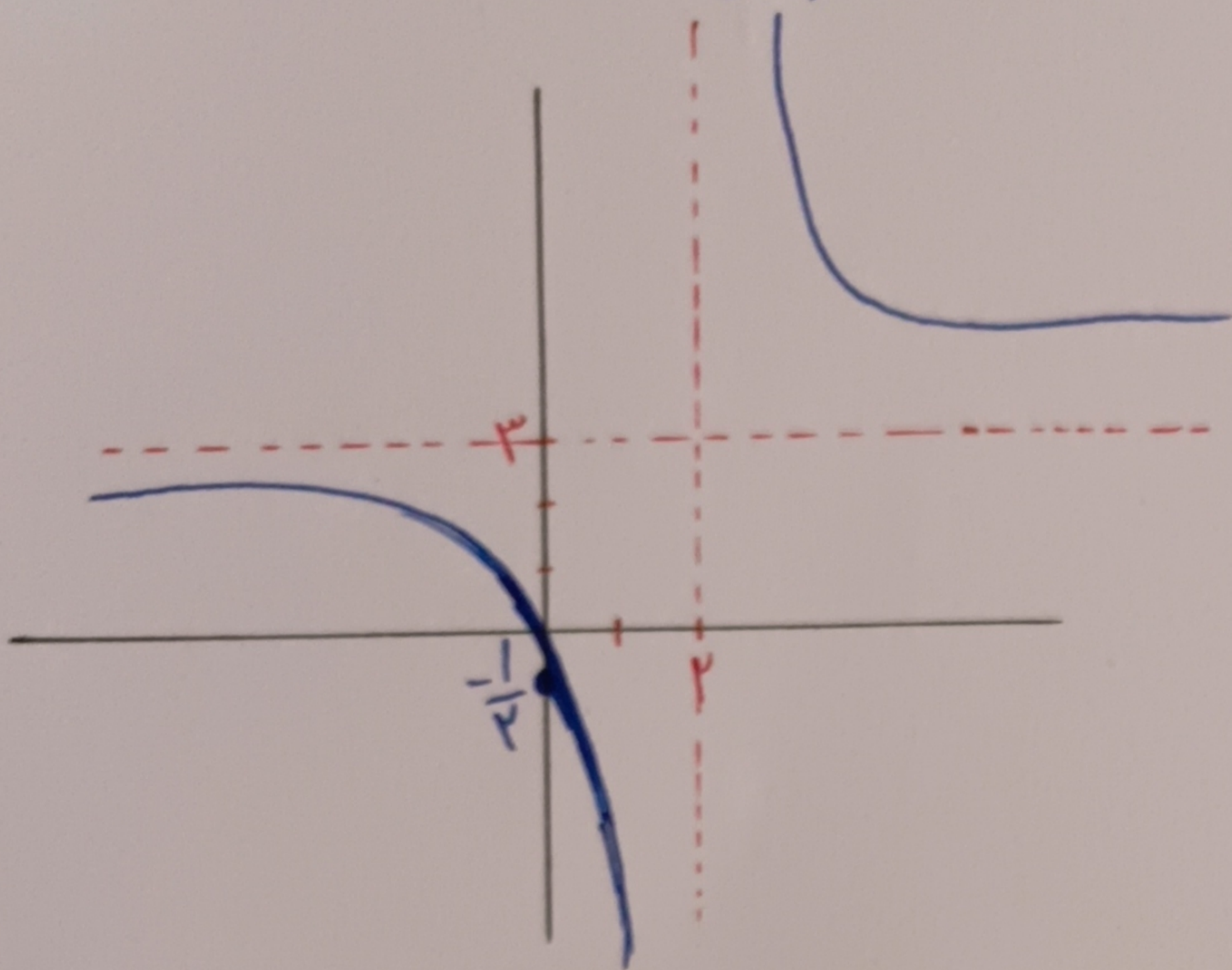
ب) $y = \sqrt{x^3 + 4x^2 + 9x + 1} \rightarrow R_f = [0, +\infty)$ زیرا هم مثبت و کند اما چون زیر رادیکال قرار گرفته اعداد منفی از زیر رادیکال نمی شوند.

الف) $y = \frac{3x + 1}{x^2 - 2} \rightarrow R_f = \mathbb{R} - \{3\}$
 $\frac{a}{c} = \frac{3}{1}$

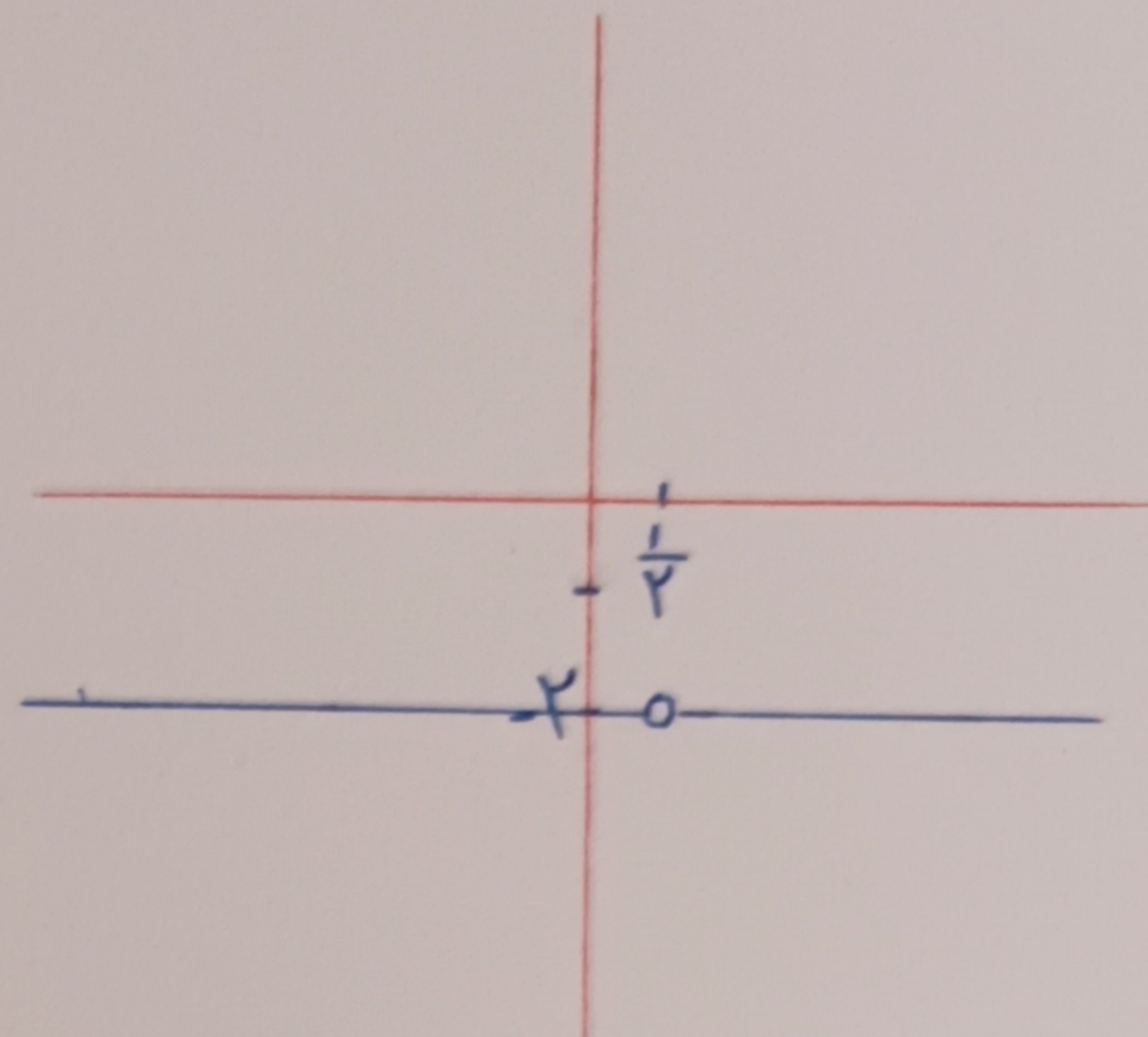
⑧

ب) $y = \sqrt{\frac{4x + 1}{x + 3}} \quad \frac{a}{c} = \frac{4}{1} = 4 \rightarrow R_f = [0, +\infty) - \{4\}$
 $\sqrt{4} = 2$

الف) $y = \frac{x^3 + 1}{x - 2} \rightarrow x \neq 2$ $\frac{a}{c} = 3$ $x=0 \rightarrow y = -\frac{1}{2}$



ب) $y = \frac{x^2 - 1}{1 - 2x} \rightarrow \frac{2(x-1)}{2x-1} = -1$
 $-(2x-1) \rightarrow x \neq \frac{1}{2}$



الف) $y = \cos^2 x + \frac{1}{\cos^2 x} \rightarrow \cos^2 x \geq 0 \Rightarrow R_f = [2, +\infty)$

ب) $y = \sqrt[3]{\frac{x^3 + 1}{x}} \rightarrow \frac{x^3}{x} + \frac{1}{x} \Rightarrow x + \frac{1}{x} \Rightarrow R_f = (-\infty, -2] \cup [2, +\infty)$