

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

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

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

ب) $y = x^2 - 5x + 1 \Rightarrow x^2 - 5x + (1-y) = 0$
 $\Delta \geq 0 \Rightarrow 25 - 4(1-y) \geq 0 \Rightarrow 21 + 4y \geq 0 \Rightarrow y \geq -\frac{21}{4} \Rightarrow R_f = [-\frac{21}{4}, +\infty)$

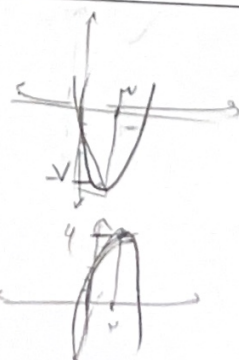
الف) $y = \frac{x^2+3}{x^2-2} \Rightarrow y(x^2-2) = x^2+3 \Rightarrow yx^2 - 2y = x^2+3 \Rightarrow x^2(y-1) = 2y+3 \Rightarrow x^2 = \frac{2y+3}{y-1}$
 $R_f = (-\infty, -1) \cup (1, +\infty)$

ب) $y = \frac{2|x|+1}{x+1} \Rightarrow y|x| + y = 2|x| + 1 \Rightarrow |x|(y-2) = 1-y \Rightarrow |x| = \frac{1-y}{y-2}$
 $\frac{1-y}{y-2} \geq 0 \Rightarrow (-\infty, -\frac{1}{2}] \cup (2, +\infty) = R_f$

$y = \frac{1}{x^2-4x} \Rightarrow y(x^2-4x) = 1 \Rightarrow yx^2 - 4yx - 1 = 0$
 $\Delta \geq 0 \Rightarrow 16y^2 - 4(y^2 - 1) \geq 0 \Rightarrow 12y^2 + 4 \geq 0 \Rightarrow 3y^2 + 1 \geq 0$
 $3y^2 + 1 \geq 0 \Rightarrow y \in \mathbb{R} \Rightarrow R_f = (-\infty, -\frac{1}{4}] \cup [0, +\infty)$

الف) $y = \frac{x^2-4x+1}{x^2-4x} \Rightarrow y = 1 + \frac{1}{x^2-4x} \Rightarrow \frac{1}{x^2-4x} = y-1$
 $R_f = [-1, +\infty)$

ب) $y = \frac{x^2-4x+1}{x^2-4x} \Rightarrow y = 1 + \frac{1}{x^2-4x} \Rightarrow \frac{1}{x^2-4x} = y-1$
 $R_f = (-\infty, 1]$



الف) $g_2 \sqrt{n^2 - 4n + 4} \Rightarrow \text{ent} \left[\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \right] \Rightarrow \sqrt{[-1, +\infty)} \cup [0, +\infty)$
 R_f

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ب) $g_2 \sqrt{-n^2 + 6n + 10} \Rightarrow \text{ent} \left[\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \right] \Rightarrow \sqrt{(-\infty, 1]} \cup [5, +\infty)$
 R_f

الف) $g_2 n^2 + 2n^2 + 2n + 1 \Rightarrow \text{نیزترین مقدار}$
 $R_f = [\mathbb{R}]$

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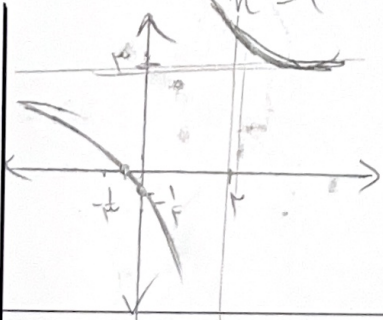
ب) $g_2 \sqrt{n^2 + 2n^2 + 4n + 1} \Rightarrow \text{دسته زیر را بنویس}$
 $[\mathbb{R}] \Rightarrow \sqrt{[\mathbb{R}]} = [0, +\infty)$

الف) $g_2 \frac{n+1}{n-2} \Rightarrow \frac{a}{c} \frac{m}{1} \Rightarrow R_f = [\mathbb{R} - \{2\}]$

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ب) $g_2 \sqrt{\frac{n+1}{n+2}} \Rightarrow \left| \frac{a}{c} \right| \frac{m}{1} \Rightarrow 2 \Rightarrow R_f = [\mathbb{R} - \{2\}]$

الف) $g_2 \frac{n+1}{n-2} \Rightarrow \left. \begin{array}{l} n=2 \rightarrow \text{موجب} \\ n \rightarrow \infty \rightarrow g_2 = -\frac{1}{2} \end{array} \right\} \frac{3}{1} \rightarrow \text{موجب افتد} \Rightarrow g_2 \geq n = -\frac{1}{2}$



ب) $g_2 - \frac{n-2}{n-1} = \frac{-2(n-1)}{n-1} \Rightarrow \frac{n-1 \neq 0}{n \neq \frac{1}{2}}$

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الف) $g_2 \cos^2 n + \frac{1}{\cos^2 n} \Rightarrow R_f = [2, +\infty)$
 $\cos^2 n > 0$

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ب) $g_2 \sqrt{\frac{n^2+1}{n}} = \sqrt{n + \frac{1}{n}} \Rightarrow R_f = (-\infty, -1] \cup [1, +\infty)$