

$$|x| = + \frac{+2y+1}{y-1}$$

$$y_1 = 1$$

$$y_2 = -\frac{1}{2}$$

$$+ \frac{-\frac{1}{2}}{0} - \frac{1}{\frac{1}{2}+}$$

الف - ا

$$R_f = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$$

$$y = \frac{|x|^2 + 1}{|x|} = |x| + \frac{1}{|x|} \Rightarrow R_f = [2, +\infty) \quad \text{ب.}$$

$$x^2 - x + 1 \neq 0$$

$$b^2 - 4ac = 1 - 4 = -3 < 0 \Rightarrow \text{لا يوجد حلا حقيقي}$$

$$D_f = \mathbb{R}$$

$$f(x) = \frac{(x - \frac{1}{x})^2}{(x - \frac{1}{x})^2 + \frac{4}{x}}$$

$$\min (x - \frac{1}{x})^2 = 0$$

$$\max (x - \frac{1}{x})^2 + \frac{4}{x} \approx 1 \Rightarrow x \rightarrow +\infty$$

$$R_f = [0, 1)$$

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

$$b^2 - 4ac \geq 0 \Rightarrow (2-y)^2 + 1 + 4y \geq 0 \quad y^2 + 2y + 1 \geq 0$$

$$(y+1)(y+1) \geq 0 \quad y_1 = -1 \quad y_2 = -1$$

$$+ \frac{-1}{0} - \frac{-1}{0} +$$

$$R_f = (-\infty, -1] \cup [-1, +\infty)$$

$$\frac{-b}{2a} = \frac{-2}{-2} = 1 \quad \min_y = -1 + 1 - 1 = -1 \Rightarrow R = \sqrt{(-\infty, 3]} = 1 \quad \text{ج. الف}$$

$$R_f = [0, 1]$$

$$\frac{-b}{2a} = \frac{1}{2} = 1$$

$$\min_y =$$

$$y_{\min} = 4 - 1 \times 2 = -1$$

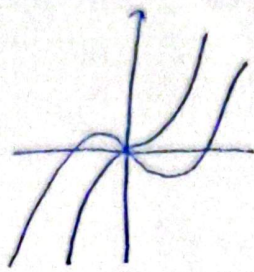
$$R = \sqrt{[-1, +\infty)} =$$

ب.

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

$$y = x^x \cdot x + 1$$

شکل



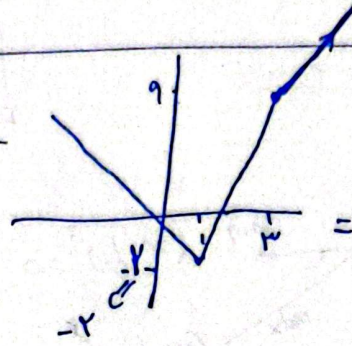
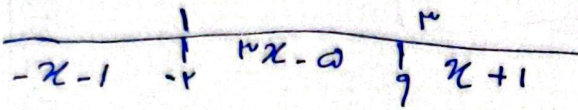
$$\Rightarrow R_f = \mathbb{R}$$

$$\log R \Rightarrow \boxed{R_f = \mathbb{R}}$$

$$\frac{x^x + 1}{x} = x + \frac{1}{x} \quad \begin{cases} x > 0 \\ \log \text{ می شود } \infty \end{cases} \Rightarrow R' = [2, +\infty)$$

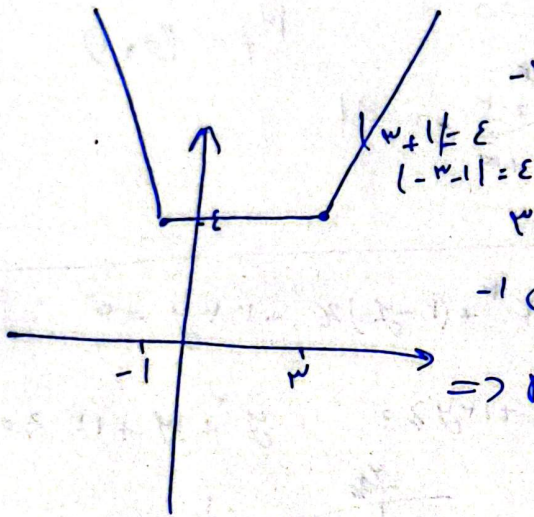
(ب)

$$\log_2 [2, +\infty) \Rightarrow R_f = [1, +\infty)$$



(4 - الف)

$$\Rightarrow R_f = [2, +\infty)$$



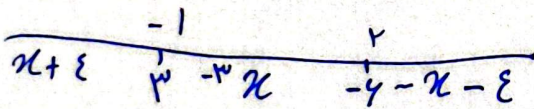
$$\begin{cases} x+1 = \varepsilon \\ |x-1| = \varepsilon \end{cases}$$

$$\Rightarrow \text{شیب عدد } 2$$

$$\Rightarrow \text{شیب قبل } -1$$

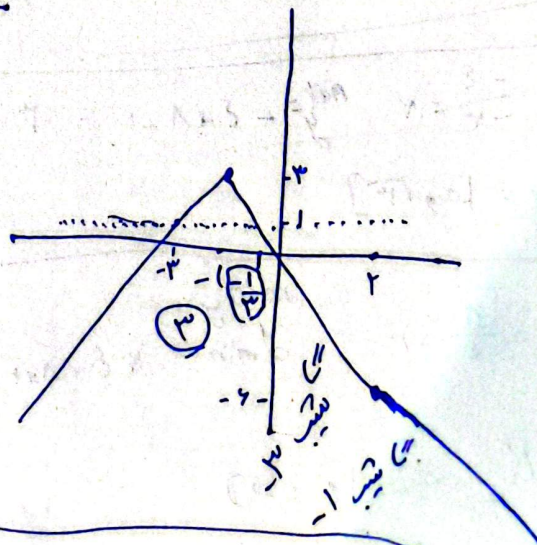
$$\Rightarrow R_f = [\varepsilon, +\infty)$$

(ب) گلدونی



$$\begin{cases} x+1 \leq 1 \\ x \leq -1 \end{cases} \quad (1)$$

$$\begin{cases} -x \leq 1 \\ x \geq -\frac{1}{x} \end{cases} \quad (2)$$



$$(1) \cap (2) \cap (3) \Rightarrow R_f = (-\infty, -1] \cup [-\frac{1}{x}, +\infty)$$

$$|x| = + \frac{+2y+1}{y-1}$$

$$y_1 = 1$$

$$y_2 = -\frac{1}{2}$$

$$+ \frac{-\frac{1}{2}}{0} - \frac{1}{\frac{1}{2}} +$$

١- الف)

$$R_f = (-\infty, -\frac{1}{2}] \cup (1, +\infty)$$

$$y = \frac{|x|^2 + 1}{|x|} = |x| + \frac{1}{|x|} \xrightarrow{x \geq 0} R_f = [2, +\infty) \quad \text{ب)}$$

$$x^2 - x + 1 \neq 0$$

$$b^2 - 4ac = 1 - 4 = -3 \Rightarrow \text{مطلوب است}$$

$$D_f = \mathbb{R}$$

$$f(x) = \left(x - \frac{1}{2}\right)^2$$

$$\left(x - \frac{1}{2}\right)^2 + \frac{3}{4}$$

min $\left(x - \frac{1}{2}\right)^2 = 0$

max $\left(x - \frac{1}{2}\right)^2 + \frac{3}{4} \Rightarrow \approx 1$
 $x \Rightarrow +\infty$

$$R_f = [0, 1)$$

سوال چهارم جانبی و اول سوال ٣ و ٢ و ١

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

$$b^2 - 4ac \geq 0 \Rightarrow (2-y)^2 + 1 + 4y \geq 0 \quad y^2 + 2y + 1 \geq 0$$

$$(y+1)(y+1) \geq 0 \quad y_1 = -1 \quad y_2 = -1$$

$$+ \frac{-1}{0} - \frac{-1}{0} +$$

$$R_f = (-\infty, -1] \cup [-1, +\infty)$$

$$\frac{b}{2a} = \frac{-1}{-2} = \frac{1}{2} \quad \text{max } y = -1 + 1 - 1 = -1 \Rightarrow R = \sqrt{(-\infty, 3]} \Rightarrow \text{الف)}$$

$$R_f = [0, \sqrt{3}]$$

$$\frac{b}{2a} = \frac{1}{2} = \frac{1}{2}$$

$$\min y =$$

$$y_{\min} = \frac{1}{4}(-1 \times 2) = -\frac{1}{2}$$

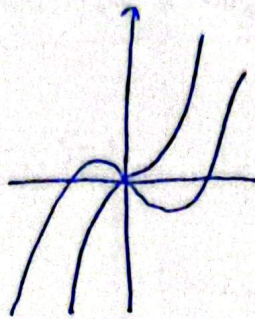
$$R = \sqrt{[-1, +\infty)} \Rightarrow$$

ب)

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

$$y = x^3 - x + 1$$

شکل



$$\Rightarrow R_f = \mathbb{R}$$

$$\log^R \Rightarrow \boxed{R_f = \mathbb{R}}$$

الف - ۵

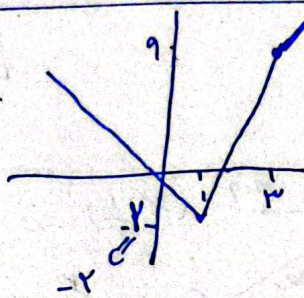
$$\frac{x^2+1}{x} = x + \frac{1}{x} \quad \begin{cases} x > 0 \\ x < 0 \end{cases} \Rightarrow R' = [2, +\infty)$$

log برای x

$$\log_{\frac{1}{x}} [2, +\infty) \Rightarrow R_f = [1, +\infty)$$

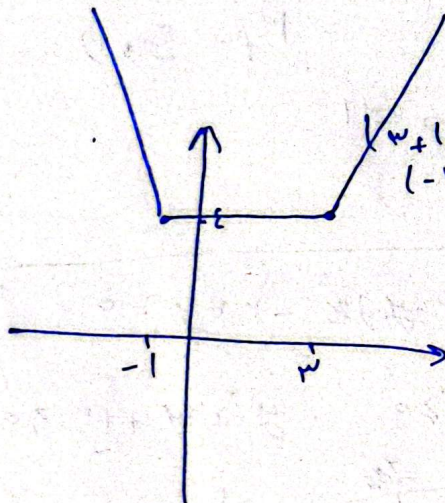
ب

$$-x-1 \quad -\frac{1}{x} \quad x-1 \quad x+1$$



الف - ۶

$$\Rightarrow R_f = [2, +\infty)$$



$$|x+1| = \varepsilon$$

$$|-x-1| = \varepsilon$$

$$\Rightarrow 2 = \text{شیب عدد}$$

$$-2 = \text{شیب قبل}$$

$$\Rightarrow R_f = [2, +\infty)$$

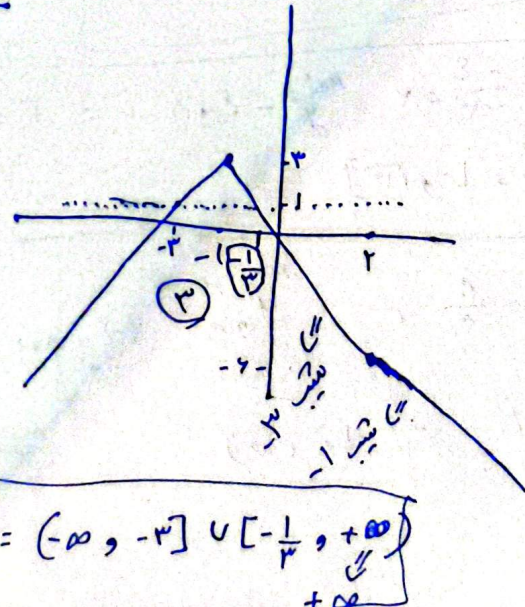
ب) گلدونی

$$x+1 \leq -1 \quad x \leq -2$$

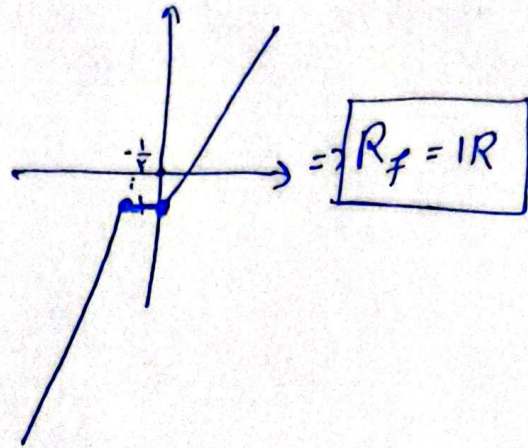
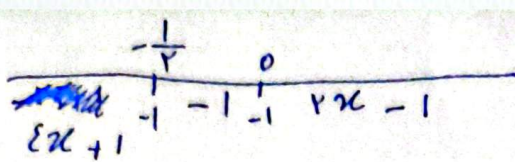
$$\textcircled{1} x \leq -2$$

$$\textcircled{2} x \geq -\frac{1}{2}$$

$$\textcircled{1} \cap \textcircled{2} \Rightarrow D_f = (-\infty, -2] \cup [-\frac{1}{2}, +\infty)$$

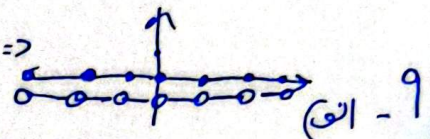


الف - ۷

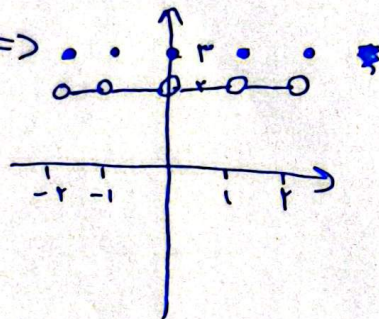


$$y = [x] + [-x] + 2$$

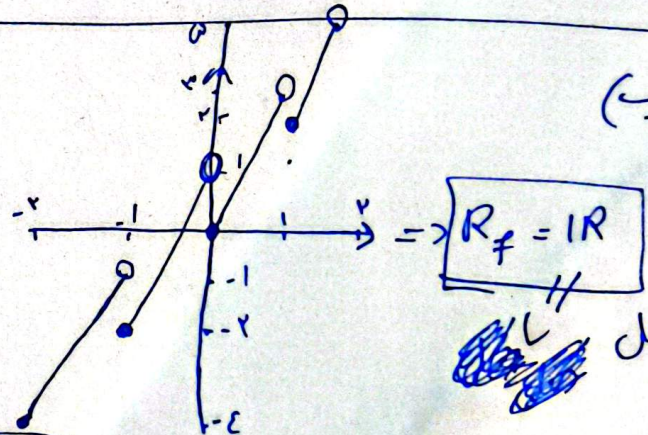
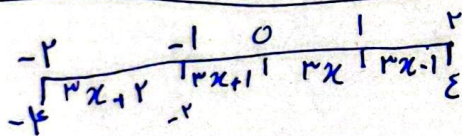
$$[x] + [-x] \Rightarrow$$



$$[x] + [-x] + 2 \Rightarrow$$



$$R_f = \{2, 3\}$$



$$R_f = [-\varepsilon, \infty) \quad (= [-2, 2] \text{ دلی بل بازه})$$

$$y = (\sin^2 x)^2 + \sin^2 x + 1$$

$$\max = 1 \Rightarrow y = 3$$

$$\min = 0 \Rightarrow y = 1$$

$$\frac{-b}{2a} = -\frac{1}{2} \Rightarrow \text{نقطه یابی}$$

$$R_f = [1, 3]$$

$$\max = 1 \Rightarrow y = 1$$

$$\min = -1 \Rightarrow y = 1 + 1 + 1 = 3$$

$$\frac{-b}{2a} = \frac{1}{2} \Rightarrow y = \frac{1}{2} - \frac{1}{2} + 1 = \frac{1}{2} \Rightarrow$$

$$R_f = \left[\frac{1}{2}, 3\right]$$

۱۰ الف