

انزهه الوردانی «یار دهم دختر» «شما جناب» «تلف» ۱۱

$$D_f = 1 - x^2 \geq 0 \rightarrow x^2 \leq 1 \rightarrow -1 \leq x \leq 1$$

$$f(x) = \sqrt{1 - x^2} \quad g = \{(-1, 1), (0, 2), (1, 0), (1, 2)\} \quad 1$$

$$2g - 3f = \{(-1, 2), (0, 2), (1, 2)\} \rightarrow R = \{2, 2, 2\} \quad 11$$

$$2g(1) - 3f(0) = 2(2) - 3(2) = 4 - 6 = -2 \quad 2g(0) - 3f(1) = 2(2) - 3(0) = 4 - 0 = 4 \quad 2g(2) - 3f(1) = 2(2) - 3(0) = 4 - 0 = 4$$

$$f(x) = 2x - 1 \rightarrow D_f = [3, +\infty) \rightarrow 3 \leq x < +\infty \rightarrow 4 \leq 2x < +\infty \rightarrow \infty < 2x - 1 < +\infty \quad 2$$

$$g(x) = \frac{1}{x}x + 3 \rightarrow D_g = (-\infty, 3] \rightarrow -\infty < x \leq 3 \rightarrow \frac{1}{x}x \leq 1 \rightarrow \frac{1}{x}x + 3 \leq 4$$

$$R_f \cup R_g = (-\infty, 4] \cup [4, +\infty) = \mathbb{R} = (4, \infty)$$

$$y = \frac{-x^2}{x} + x + 3 \rightarrow -x^2 + 2x + 3 > 3 \rightarrow -x^2 + 2x + 3 > 0 \quad 3$$

$$R_y = (a, b) \rightarrow (-4, 0) \rightarrow \sqrt{b - a} = 2$$

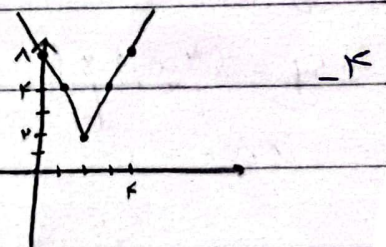
$$\left(y = \frac{-\Delta}{\epsilon a} = \frac{-(4 - \epsilon a + a - 3)}{\epsilon} = -\frac{1 - \epsilon a}{\epsilon} \right)$$

$$R_y > \frac{1}{x} \rightarrow R_y > 3$$

$$\max \sqrt{b - a} = 2$$

$$y = |x - 1| + |x - 3| + |2x - 4|$$

$$\begin{matrix} x \leq 1 & 1 \leq x \leq 3 & x \geq 3 \\ y = 4 & y = 2 & y = 2 \end{matrix}$$



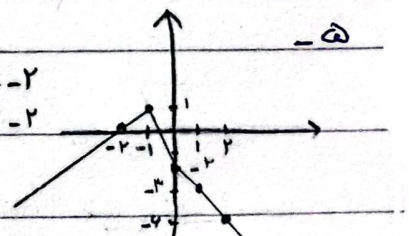
$$x = 4 \rightarrow y = 3 + 1 + 4 = 8 \quad x = 0 \rightarrow y = 1 + 3 + 4 = 8$$

$$\min = 2$$

$$y = |x| - 2|x + 1|$$

$$\begin{matrix} x \leq 0 & 0 \leq x \leq -1 & x \geq -1 \\ y = -2 & y = 1 & y = 1 \end{matrix}$$

$$R = (-\infty, 1]$$



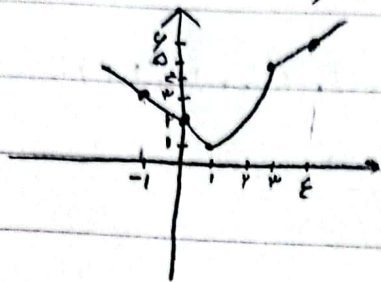
$$y = \frac{x^2 + \omega x + m}{x + 1} \rightarrow yx + y = x^2 + \omega x + m \rightarrow x^2 + (\omega - y)x + m - y = 0 \quad 4$$

$$R = \mathbb{R} \quad \Delta = (\omega - y)^2 - 4(m - y) = y^2 - 1\omega y + 2\omega - 4m + 4y$$

$$\Delta < 0 \rightarrow 14 - 4(14 - 4m) < 0 \rightarrow 14 - 14 + 16m < 0$$

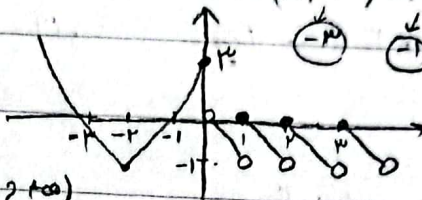
$$14m < 44 \rightarrow m < 4 \rightarrow \{1, 2, 3\}$$

$$f(x) = \begin{cases} x+1 & ; x \geq 1 \\ x^2 - 2x + 1 & ; 0 \leq x < 1 \\ |x| + 1 & ; x < 0 \end{cases} \rightarrow \begin{matrix} x=1 \rightarrow y=2 \\ x=0 \rightarrow y=1 \\ x=-1 \rightarrow y=2 \end{matrix} \rightarrow \text{cat} / \text{ } -V$$



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

$$f(x) = \begin{cases} x^2 + \epsilon x + 1, & x \leq 1 \\ [2x] - 1, & x > 1 \end{cases} \rightarrow \begin{matrix} x^2 + \epsilon x + 1 = (x+1)(x+1) \rightarrow \frac{-b}{2a} = -1 \\ y = -1 \end{matrix}$$



$$R_f = (-1, 0] \cup [1, +\infty) \rightarrow [-1, +\infty)$$

$$y = a+1 - \sqrt{2x+3} \rightarrow 2x+3 \geq 0 \rightarrow x \geq -\frac{3}{2} \rightarrow b = -\frac{3}{2} - 9$$

$$D_g = [b, +\infty)$$

$$R_g = (-\infty, a]$$

$$ab \leq \epsilon a - \frac{3}{2} = -4$$

$$g = \frac{f(x)}{4} = \frac{g(x)}{4} \quad D_f = D_g, \quad f(x) + g(x) = 3\sqrt{2x+3} - 10$$

$$x+1 \geq 0 \rightarrow x \geq -1 \rightarrow x \in [-1, 1) \quad f(x) = 1\sqrt{x+1} + \epsilon\sqrt{1-x}$$

$$x-1 \geq 0 \rightarrow x \geq 1$$

$$f(1) = 1\sqrt{2}, \quad f(-1) = 1\sqrt{0}, \quad f(0) = 1$$

$$f(1) + g(1) = 3\sqrt{2+1} = 3\sqrt{3}$$

$$f(-1) + g(-1) = 3\sqrt{0} = 0 \rightarrow g(1) = 3\sqrt{2} - 1\sqrt{2} = \sqrt{2}$$

$$y(1) = \frac{1\sqrt{2}}{4} - \frac{\sqrt{2}}{4} = 0$$

$$y(-1) = \frac{\epsilon\sqrt{2}}{4} - \frac{-\sqrt{2}}{4} = \sqrt{2}$$

$$R_f = [0, \sqrt{2}]$$