

۲۰

«انزهة الورداني» «یار دهم دختر» «شماره ۱» «تلف ۱۱۸»

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

$$f(x) = \sqrt{1 - x^2} \quad g = \{(-1, 1), (0, 1), (1, 0), (1, 2)\} \quad (۲) - ۱$$

$$2g - 3f = \{(-1, 2), (0, 1), (1, 1)\} \rightarrow R = \{2, 1, 1\} \quad (۱۱)$$

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

$$f(x) = 2x - 1 \rightarrow D_f = [3, +\infty) \rightarrow 3 \leq x < +\infty \rightarrow 4 \leq 2x < +\infty \rightarrow \infty < 2x - 1 < +\infty \quad (۲)$$

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

$$R_f \cup R_g = (-\infty, 4] \cup [3, +\infty) = \mathbb{R} - (4, 3)$$

$$y = \frac{-x^2}{x} + x + 3 \rightarrow -x^2 + 2x + 3 > 3 \rightarrow -x^2 + 2x > 0 \quad (۲) - ۳$$

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

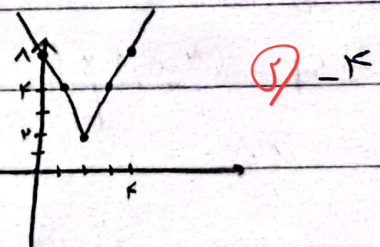
$$\begin{aligned} x^2 - 2x - 3 < 0 \\ y = \frac{-\Delta}{2a} = \frac{-(2 - 4 \pm 16 - 12)}{2} = -1 \end{aligned}$$

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

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

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

$$\begin{aligned} x \leq 1 & \quad x \leq 3 & \quad x \leq 2 \\ y \geq 4 & \quad y \geq 4 & \quad y \geq 4 \end{aligned}$$



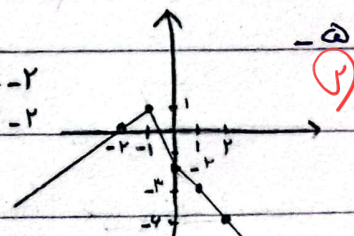
$$x = 4 \rightarrow y = 3 + 1 + 4 = 8 \quad x = 0 \rightarrow y = 1 + 3 + 4 = 8$$

$$\min = 2$$

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

$$\begin{aligned} x \geq 0 & \quad x \geq -1 \\ y \geq -2 & \quad y \geq 1 \end{aligned}$$

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



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

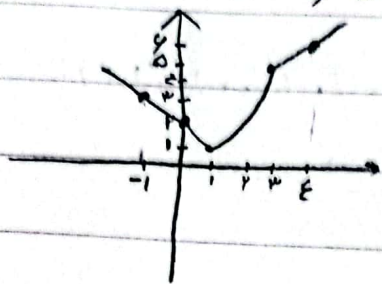
$$R = \mathbb{R}$$

$$\begin{aligned} \Delta = (\omega - y)^2 - 4(m - y) & \leq y^2 - 1 \cdot y + 4\omega - 4m + 4y \\ & = y^2 - 4y + 4\omega - 4m \rightarrow y \leq \frac{4 \pm \sqrt{16 - 4(4\omega - 4m)}}{2} \end{aligned}$$

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

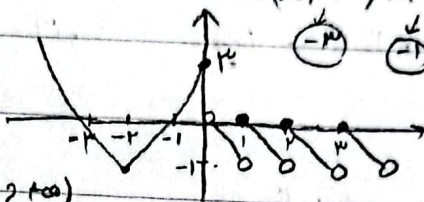
$$16m < 16\omega \rightarrow m < \omega \rightarrow \{1, 2, 3\}$$

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



$R_f = [1, +\infty)$

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



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

$y = a+1 - \sqrt{2x+3} \rightarrow 2x+3 \geq 0 \rightarrow x \geq -\frac{3}{2} \rightarrow b = -\frac{3}{2}$
 $D_g = [b, +\infty)$

$R_g = (-\infty, a]$

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

$g = \frac{f(x)}{4} = \frac{g(x)}{4} \quad D_f = D_g \rightarrow f(x) + g(x) = 3\sqrt{2x+3} - 1$

$x+1 \geq 0 \rightarrow x \geq -1 \rightarrow x \in [-1, 1)$
 $x-1 \geq 0 \rightarrow x \geq 1$

$f(1) = 2\sqrt{2}, f(-1) = 2\sqrt{2}, f(0) = 4$

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

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

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

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