

$$f(x) = \sqrt{1-x^2} \quad 1-x^2 \geq 0 \quad -(x \leq 1) \quad D_f = [-1, 1]$$

$$D_f \cap D_g = \{-1, 0, 1\}$$

$$R_g = \{(-1, 2), (0, 1), (1, 0), (1, 1)\}$$

$$R_{g \circ f} = \begin{cases} x=1 \rightarrow R_{g \circ f} = 2 \\ x=0 \rightarrow R_{g \circ f} = 1 \\ x=-1 \rightarrow R_{g \circ f} = 2 \end{cases}$$

$$2 + 1 + 1 = 4$$

$$f(x) = x-1 \rightarrow D = [3, +\infty) \xrightarrow{x=3} f(x) = 2 \quad R = [2, +\infty)$$

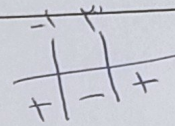
$$g(x) = \frac{1}{x} x + 3 \rightarrow D = (-\infty, 3] \xrightarrow{x=3} f(x) = 4 \quad R = (-\infty, 4]$$

$$R_{g \circ f} = (-\infty, 4] \cup [2, +\infty) = R_{(-2, 4)}$$

$$\frac{-x^2 + x + 3}{x} > \frac{x}{x} \rightarrow \frac{-x^2 + x + 3}{x} > 1 \rightarrow \frac{-x^2 + x + 3 - x}{x} > 0 \rightarrow \frac{-x^2 + 3}{x} > 0$$

$$x=3$$

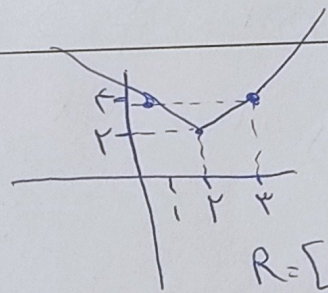
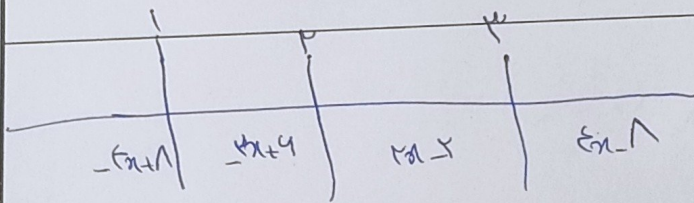
$$x=-1$$



$$R = (-1, 3)$$

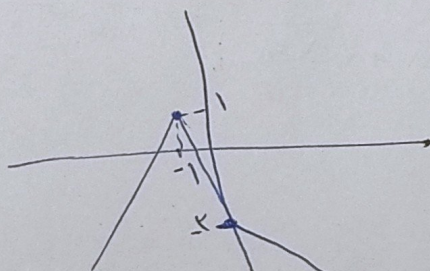
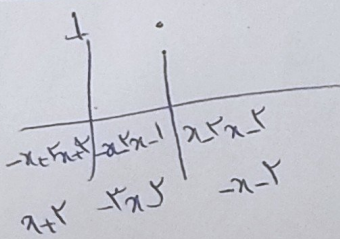
$$a=-1 \quad b=3$$

$$\sqrt{b-a} = \sqrt{3-(-1)} = 2$$



$$R = [2, +\infty)$$

$$2 = \text{حداقل مقدار}$$



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

$$y^2 + y = x^2 + \omega x + m \quad x^2 + x(\omega - y) + m - y = 0 \quad \Delta \geq 0 \quad (\omega - y)^2 - 4(m - y) = y^2 - 4y + \omega^2 - 4m \geq 0$$

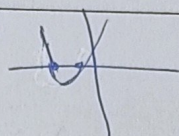
$$y^2 - 4y + \omega^2 \geq 4m - 4 \quad (y^2)^2 \geq 4m - 4$$

$$\begin{cases} m > 1 \rightarrow g = \sqrt{4m - 4} \quad \overline{00E} \\ m = 1 \quad R = \{1\} \quad \overline{00E} \\ m < 1 \quad (y^2)^2 \geq 0 \quad \overline{1000} \end{cases}$$

$$\begin{cases} x < 1 \rightarrow R = [\omega, +\infty) \\ x^2 - 2x + 1 \rightarrow R = [1, \omega) \\ |x| < 1 \rightarrow R = (-1, +\infty) \end{cases}$$

$$R_{\text{eff}} = [\omega, +\infty) \cup [1, \omega) \cup (-1, +\infty) = \overline{[-1, +\infty)}$$

$$\begin{cases} x^2 + 2x + 1 \quad n = \frac{b}{a} = -1 \quad y = -1 \quad R = [-1, +\infty) \\ [x] - x \rightarrow R = (-1, 0] \end{cases}$$



$$[-1, +\infty) \cup (-1, 0] = \overline{[-1, +\infty)}$$

$$x < 1 \rightarrow R = [-\frac{x}{1-x}, +\infty) \quad b = -\frac{x}{1-x}$$

$$x = -\frac{x}{1-x} \rightarrow y = a + 1 = \omega \rightarrow a = x$$

$$a \times b = x \times \left(-\frac{x}{1-x}\right) = \overline{-\frac{x^2}{1-x}}$$

$$x+1 > 0 \quad x > -1 \quad 1-x > 0 \quad 1 > x \quad R = \bigcap_{i=1}^4 R_i = [-1, 1]$$

$$g(x) = \sqrt{x+1} - \sqrt{x-1} = \sqrt{x+1} - \sqrt{x-1}$$