

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

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

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

$$rg - rf = \{2, 2, 2\} \quad 2+2+2=6$$

$$f(x) = 2x-1 \rightarrow [3, +\infty) \quad g(x) = \frac{1}{x}x+3 \rightarrow (-\infty, 3] \quad (2)$$

$$Rf = [3, +\infty) \quad Rg = (-\infty, 3]$$

$$Rf \cap Rg = (-\infty, 3] \cap [3, +\infty) = \{3\}$$

$$g = -\frac{x^2}{x} + x + 3 \quad Rf = (\frac{3}{x}, +\infty) \quad (3)$$

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

$$-x^2 + x + 3 > 3 \quad \times x$$

$$-x^2 + x + 3 > 0$$

$$-x^2 - x - 3 < 0$$

$$-(x-3)(x+1) < 0$$

$$x=3 \quad x=-1$$

$$\begin{array}{c} -1 \quad 3 \\ + \quad - \quad + \end{array}$$

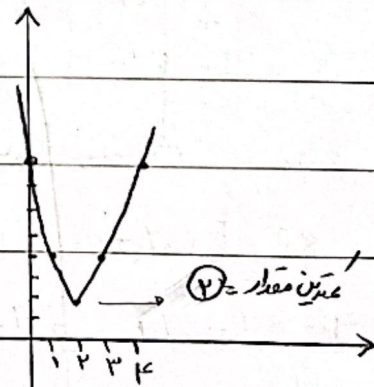
$$Rf = (-1, 3)$$

$$\sqrt{b-a} = \sqrt{3-(-1)} = 2 \quad (4)$$

$$x=1 \quad x=3 \quad x=0$$

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

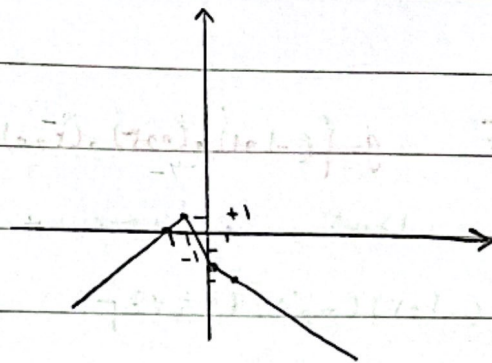
$$\begin{array}{c} 1 \quad 2 \quad 3 \\ -x+1 \quad -x+4 \quad x-2 \quad x-1 \end{array}$$



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

$$\begin{array}{c} -1 \quad 0 \\ x+2 \quad -3x-2 \quad -x-2 \end{array}$$

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



$$y = \frac{x^2 + \omega x + m}{x+1}$$

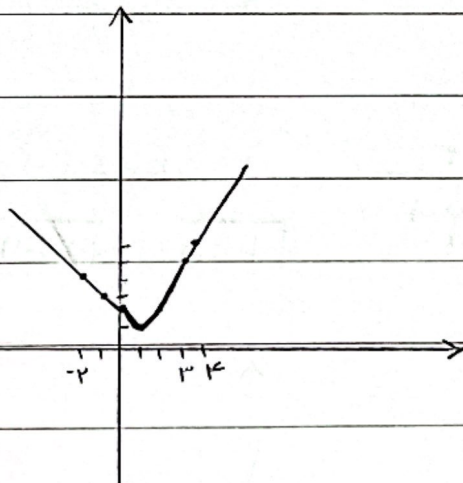
$$x^2 + (\omega - y)x + m - y = 0$$

$$\Delta \geq 0 \rightarrow y - \omega \pm \sqrt{(\omega - y)^2 - 4(m - y)} \geq 0$$

$$\Delta \geq 0 \rightarrow y^2 - 4y + 4\omega - 4m \geq 0$$

$$\begin{cases} a > 0 \rightarrow 1 > 0 \\ \Delta < 0 \rightarrow m < 4 \end{cases} \quad m = 1, 2, 3$$

$$f(x) = \begin{cases} x+2 & x \geq 3 \\ x^2 - 2x + 2 & 0 < x < 3 \\ |x| + 2 & x < 0 \end{cases}$$



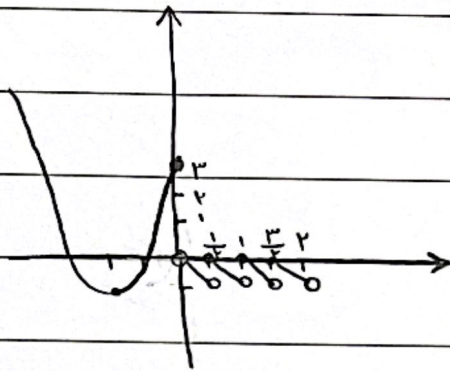
$$Rf = [1, +\infty)$$

$$f(x) = \begin{cases} x^2 + rx + r & x \leq 0 \\ [rx] - rx & x > 0 \end{cases}$$

(1)

$$\text{ext} = \begin{cases} -r \\ 1 \end{cases}$$

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



$$y = a + 1 - \sqrt{rx + r}$$

(9)

$$\text{no} \rightarrow rx + r \geq 0 \quad \left[-\frac{r}{r}, +\infty\right)$$

$$rx \geq -r \rightarrow x \geq -\frac{r}{r}$$

$$\boxed{b = -\frac{r}{r}}$$

$$a = a + 1 - 0$$

$$\boxed{r = a}$$

$$ab \rightarrow -\frac{r}{r} \times r = (-9)$$

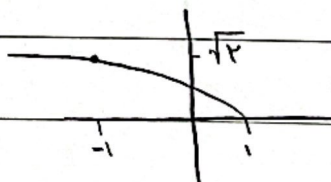
$$f(x) + g(x) = r\sqrt{1+x} + r\sqrt{1-x} = r(\sqrt{1-x} + \sqrt{1+x})$$

(10)

$$\text{no} \rightarrow r(\sqrt{1-x} + \sqrt{1+x})$$

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

$$\frac{f(x)}{r} = \frac{g(x)}{r} = \sqrt{1-x}$$



$$R = [0, \sqrt{r}]$$