

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

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

$$2g - 3f = \{(-1,2)(0,4)(1,2)\} \Rightarrow S = 2 + 4 + 2 = 11$$

$$f(x) = 2x-1 \quad D_f = [3, +\infty) \quad x=3 \Rightarrow y=5 \quad R = [5, +\infty)$$

$$g(x) = \frac{1}{x} x+3 \quad D_g = (-\infty, 3] \quad x=3 \Rightarrow y=4 \quad R = (-\infty, 4]$$

$$R_f \cup R_g = (-\infty, 4] \cup [5, +\infty)$$

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

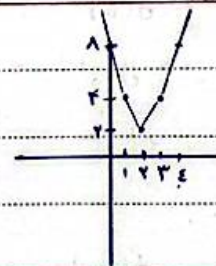
$$\Rightarrow (x-3)(x+1) < 0 \quad \frac{-1}{x+1} < \frac{3}{x+1} \Rightarrow (a,b) = (-1,3)$$

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

$$y = |x-1| + |x-3| + |x-5|$$

$$x=5 \rightarrow \Delta$$

$$x=0 \rightarrow \Delta$$

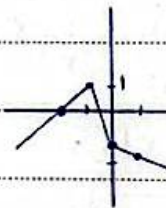


$$y_{min} = 2$$

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

$$x=1 \rightarrow -3$$

$$x=-1 \rightarrow 0$$



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

$$y = \frac{x^2 + 2x + m}{x+1} \Rightarrow \frac{(x+1)(x+2) + (m-2)}{x+1} \quad R = \mathbb{R}$$

$$\text{if } m=2 \rightarrow y = (x+2) \Rightarrow R = \mathbb{R} - \{2\}$$

$$\Rightarrow m \neq 2 \quad (1)$$

$$x^2 + 2x + m \neq y(x+1) \Rightarrow x^2 + (2-y)x + (m-y) = 0 \Rightarrow \Delta = (2-y)^2 - 4(m-y) > 0$$

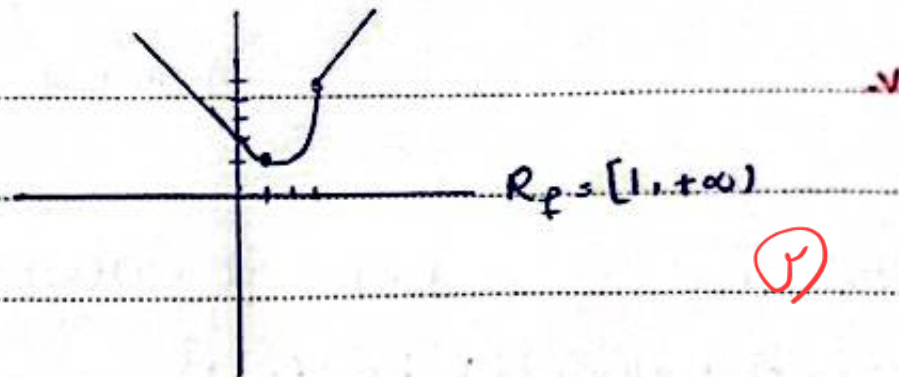
$$y^2 - 4y + 4 - 4m + 4y > 0 \Rightarrow (y-2)^2 - 4(m-1) > 0 \quad y=3 \Rightarrow -4m+14 > 0 \Rightarrow m < 3.5 \quad (2)$$

$$(1), (2) \rightarrow m = \{1, 2, 3\}$$

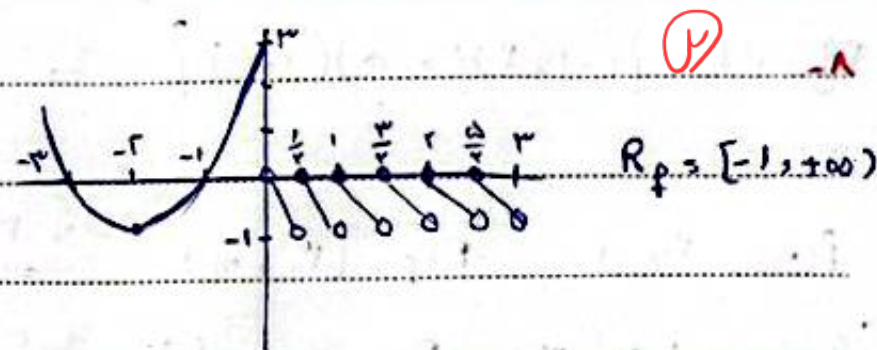
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$$\begin{cases} x+r & ; x \geq r \\ x^r - r \ln x & ; 0 < x < r \rightarrow \min \left| \frac{-b}{ra} = 1 \right. \\ |x|+r & ; x < 0 \end{cases}$$



$$\begin{cases} x^r + r \ln x + r & ; x \leq 0 \rightarrow \min \left| \frac{-b}{ra} = -r \right. \\ [r x] - r \ln x & ; x > 0 \end{cases}$$



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

$$D_f = [b, +\infty) \quad R_f = (-\infty, \Delta]$$

$$D = [b, +\infty) \rightarrow r \ln x + r > 0 \Rightarrow x > \frac{-r}{r} \rightarrow b = \frac{-r}{r}$$

$$-\sqrt{r \ln x + r} < 0 \xrightarrow{r(a+1)} y < a+1 \Rightarrow a+1 = \Delta \rightarrow a, r \Rightarrow ab = \frac{-r}{r} \cdot r = -4$$

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

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

$$y = \frac{f(x)}{4} - \frac{g(x)}{4} = \frac{f(x)}{4} - \frac{1}{4}(\sqrt{1+x} + \sqrt{1-x} - f(x)) = \frac{f(x)}{4} - \frac{\sqrt{1+x} + \sqrt{1-x}}{4}$$

$\xrightarrow{4} \text{ dom } = [-1, 1]$

$$\Rightarrow \sqrt{1+x} + \sqrt{1-x} - \sqrt{1+x} - \sqrt{1-x} = \sqrt{1+x} + \sqrt{1-x} - \sqrt{(\sqrt{1+x} + \sqrt{1-x})^2}$$

$$\equiv \sqrt{1+x} + \sqrt{1-x} - \sqrt{1+x} - \sqrt{1-x} = \sqrt{1-x}$$

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