

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

$\hookrightarrow \frac{-1}{-4+4} = \frac{-1}{0}$ (۲)

$fg - 3f = 0$

$2g \rightarrow \{(-1, 2), (0, 8), (2, 0), (1, 4)\}$

$f \in D(f) = [-1, 1]$
 $f = \{(-1, 0), (1, 0), (0, 1)\}$

$2g - 3f = \{(-1, 2), (0, 8), (1, 4)\}$

$3f = \{(-1, 0), (1, 0), (0, 3)\}$

$2+8+0=10$

$f(x) = 2x-1$ $D(f) = [2, \infty) \rightsquigarrow R_f = [2, \infty)$ (۴)

$g(x) = \frac{1}{x}x+3$ $D(g) = (-\infty, 3] \rightsquigarrow R_g = (-\infty, 3]$ (۵)

$R_f \cup R_g = (-\infty, 3] \cup [2, \infty)$

$g = -\frac{x^2}{2} + x + 3$ $-\frac{x^2}{2} + x + 3 > \frac{1}{2} \rightarrow -\frac{x^2}{2} + x + \frac{5}{2} > 0$ (۶)

$\frac{-1 \pm \sqrt{1-4(-\frac{1}{2})(\frac{5}{2})}}{2(-\frac{1}{2})} = \frac{-1 \pm \sqrt{1+10}}{-1} = \frac{-1 \pm \sqrt{11}}{-1}$

$\rightarrow D(f) = (-1, 3) \rightarrow \sqrt{b-a} = \sqrt{4-2}$

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

۱	۲	۳
$-x+1$	$-x+3$	$-x+5$
$x-1$	$x-3$	$x-5$
$x+1$	$x+3$	$x+5$

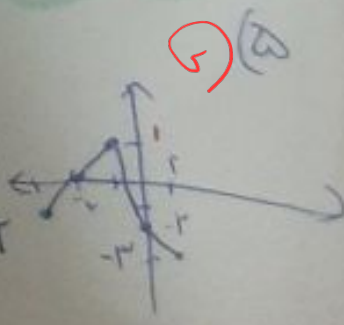
کمترین مقدار $\rightarrow \frac{1}{2} \rightarrow$

$x \rightarrow 0$
 $\hookrightarrow -1$

$\begin{cases} x > 0 \\ -1 \leq x < 0 \\ x < -1 \end{cases}$

$x - 2x - 2 \rightarrow -x - 2$
 $-x - 2x - 2 = -3x - 2$
 $-x + 2x + 2 = x + 2$

$R_A = \{x > 1\}$



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

$$(\omega - y)^2 - 4(x - y) \geq 0 \rightarrow 4x + y^2 + 4y - 4x + 4y \geq 0$$

$$y^2 - 4y = 4x - 4y \geq 0$$

$$\Delta \rightarrow \frac{4y - 100 + 44m}{-44} \rightarrow 4 > m$$

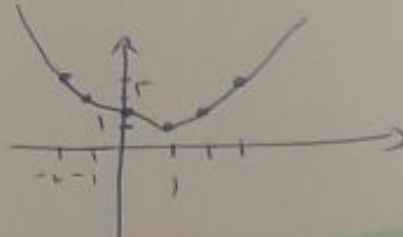
$$\rightarrow m \in [1, 4]$$

$$m = f \rightarrow \frac{m + \omega x + 4}{m + 1} \Rightarrow m + 4 = m - 1 \rightarrow m \neq 4$$

0.55

$$f(x) = \begin{cases} x + 4 & x \geq 4 \\ x^2 - 2x + 4 & x < 4 \\ |x| + 4 & x < 0 \end{cases}$$

$f_{\min}(f) \in [1, \infty)$



(5)

$$f(x) = \begin{cases} x^2 + 4x + 4 & x \leq 0 \\ [4x] - 2x & x > 0 \end{cases}$$

$$\hookrightarrow -1 \leq [4x] - 2x < 0 \rightarrow (-1, 0)$$



$$R(f) = [-1, 0)$$

(1)

$$y = ax + 1 - \sqrt{mx + 4} \quad D = [b, +\infty) \quad IR = (-\infty, a]$$

$$mx + 4 \geq 0 \rightarrow 4x \geq -4 \rightarrow x \geq -1 \rightarrow b = -1$$

$$ab = -4 \quad \text{if } b = -1 \Rightarrow \sqrt{0} = 0$$

$$f(x) = 4\sqrt{x+1} + 4\sqrt{1-x} - \sqrt{4x+4} + \sqrt{14-14x}$$

$$g(x) = -4\sqrt{x+1} - 4\sqrt{1-x} + 4\sqrt{2+2\sqrt{1-x}}$$

$$y = f(x) - 4g(x) = 4\sqrt{x+1} + 12\sqrt{1-x} - 4\sqrt{2+2\sqrt{1-x}} \rightarrow$$

$$y = \frac{4}{\sqrt{x+1}} + \frac{4}{\sqrt{1-x}} - \sqrt{4+4\sqrt{1-x}} \rightarrow -1 \leq x \leq 1$$

$$R(f) = [1, \infty)$$

$$\rightarrow x = -1 \rightarrow \sqrt{0} = 0$$

(1)