

$$f(x) = \sqrt{(1-x)(1+x)} \quad \frac{x}{p} \mid \frac{-1}{-q} + \frac{1}{q} - \frac{0}{f} = [-1, 1]$$

(1)

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

افزایش از $g(x)$
که کارهای

$$2g - 3f = \{(-1, 2), (0, 3), (1, 2)\} \quad \text{مجموع بردها} = 2 + 3 + 2 = 11$$

$$D_f = [2, +\infty) \quad f(x) = 2x - 1 \rightarrow f(x) = \{5, 7, 9, \dots\}$$

(2)

$$D_g = (-\infty, 3] \quad g(x) = \frac{1}{x}x + 3 \rightarrow g(x) = \{\frac{14}{3}, \frac{11}{3}, \frac{10}{3}, \dots\}$$

$$R_f = \mathbb{R} - (4, \infty)$$

$$-\frac{x^2}{x} + x + 3 > \frac{x}{x} \rightarrow -\frac{x^2}{x} + x + \frac{x}{x} > 0 \xrightarrow{x(-1)} x^2 - 2x - 3 < 0$$

$$(x-3)(x+1) < 0 \quad \frac{x}{p} \mid \frac{-1}{+q} - \frac{3}{q+} \quad D_f = (-1, 3) \quad \sqrt{b-a} = \sqrt{4} = 2$$

(3)

1	2	3
$-4x + 11$	$-2x + 4$	$2x - 2$
$\begin{bmatrix} 0 \\ 1 \end{bmatrix}$	$\begin{bmatrix} 1 \\ 2 \end{bmatrix}$	$\begin{bmatrix} 2 \\ 1 \end{bmatrix}$

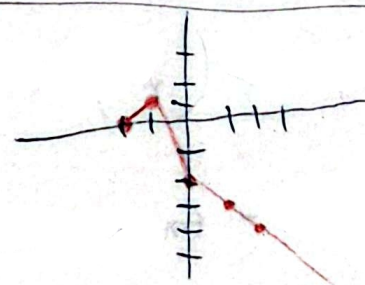
معبرین مقدار $g=2$ یا $g=1$ $x=$

(4)

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

-1	0
$x+2$	$-x-2$
$\begin{bmatrix} -2 \\ 0 \end{bmatrix}$	$\begin{bmatrix} 0 \\ -2 \end{bmatrix}$

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



(5)

$$2x + y = x^2 + 5x + m \rightarrow x^2 + (5-y)x + m - y \rightarrow x = \frac{y-5 \pm \sqrt{25+y^2-10y-4(m-y)}}{2}$$

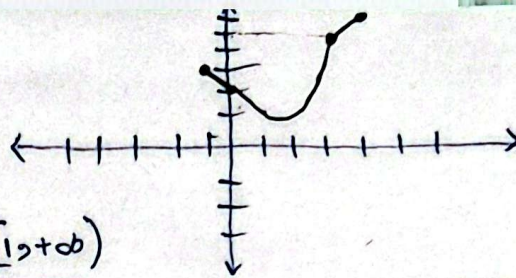
$$\rightarrow \sqrt{y^2 - 10y + 4y + 25 - 4m} \rightarrow y^2 - 4y + 25 - 4m \geq 0 \rightarrow \Delta \leq 0$$

$$16 - 4(1)(25 - 4m) \leq 0 \rightarrow 16 - 100 + 16m \leq 0 \rightarrow 16m \leq 84$$

$$m \leq 5.25 \quad m = \{1, 2, 3, 4\}$$

$$\begin{array}{c|c} 0 & \mu \\ \hline -x+2 & x^2-2x+2 \\ \left[\begin{smallmatrix} -1 \\ \mu \end{smallmatrix} \right] & \left[\begin{smallmatrix} 0 \\ \mu \end{smallmatrix} \right] \left[\begin{smallmatrix} 1 \\ 1 \end{smallmatrix} \right] \left[\begin{smallmatrix} 2 \\ 2 \end{smallmatrix} \right] \left[\begin{smallmatrix} \mu \\ \mu \end{smallmatrix} \right] \left[\begin{smallmatrix} 4 \\ 4 \end{smallmatrix} \right] \end{array}$$

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

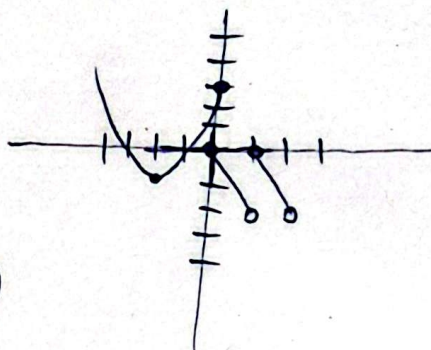


(7)

$$\begin{array}{c|c} 0 & \\ \hline x^2+4x+3 & [2x] - 2x \\ \left[\begin{smallmatrix} 0 \\ \mu \end{smallmatrix} \right] & \end{array}$$

$x = \frac{-b}{2a} = -2$
 $y_3 = -1$

$$R_f = (-2, +\infty)$$



(8)

(9) برای اشیاء بیشترین مقدار برد یا همان ω را داشته باشیم با بیشترین مقدار
 یعنی نصف را داشته باشیم پس $b = -1.5$

$$\omega = a + 1 \rightarrow \boxed{a = 4}$$

$$ab = \frac{\mu}{\nu} \times 4 = -4$$

(10)

$$g(x) = f(x) + g(x) - f(x) = \mu \sqrt{2 + 2\sqrt{1-x^2}} - \nu (\sqrt{x+1} + 2\sqrt{1-x})$$

$$y = \frac{\nu (\sqrt{x+1} + 2\sqrt{1-x})}{4} - \frac{\mu \sqrt{2 + 2\sqrt{1-x^2}} - \nu (\sqrt{x+1} + 2\sqrt{1-x})}{\mu} =$$

$$y = 2\sqrt{1-x} + \sqrt{x+1} - \sqrt{2 + 2\sqrt{1-x^2}} \rightarrow D_f = [-1, 1]$$

$$y \xrightarrow{x=1} 0$$

$$y \xrightarrow{x=0} 1$$

$$y \xrightarrow{x=-1} \sqrt{\mu}$$

$$R_f = [0, +\sqrt{\mu}]$$