

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

$$f(x) = \sqrt{1-x^2} \rightarrow x = -1 \vee 0 \vee 1 \vee 2 \times 1 \vee \begin{matrix} \nearrow (-1, 0) \\ \rightarrow (0, 1) \\ \searrow (1, 0) \end{matrix}$$

$$2g - 3f = \{(-1, 2), (0, 5), (1, 4)\}$$

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$$f(x) = 2x - 1, D_f = [3, +\infty) \rightarrow R_f = [5, +\infty)$$

$$g(x) = \frac{1}{3}x + 3, D_g = (-\infty, 3] \rightarrow R_g = (-\infty, 4]$$

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

$$\begin{matrix} (-1, 3) \\ a \quad b \end{matrix}$$

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

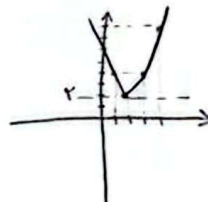
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$$y = |x-1| + |x-3| + |2x-4|$$

$$x \geq 3: x-1+x-3+2x-4 = 4x-8$$

$$2 \leq x < 3: x-1+3-x+2x-4 = 2x-2$$

$$1 \leq x < 2: x-1+3-x+4-2x = -2x+6$$

$$x < 1: 1-x+3-x+4-2x = -4x+8$$


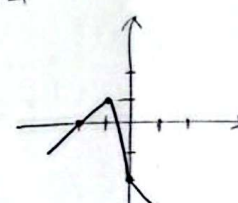
کمترین مقدار = ۲

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

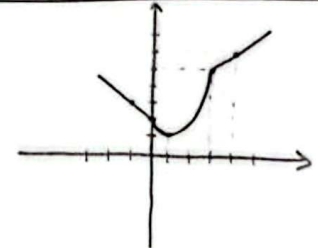
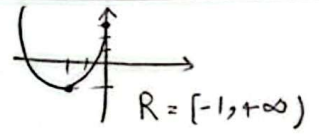
$$x > 0: x - 2x - 2 = -x - 2$$

$$-1 < x \leq 0: -x - 2x - 2 = -3x - 2$$

$$x \leq -1: -x + 2x + 2 = x + 2$$


$R_f = (-\infty, 1]$

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$y = \frac{x^2 + 5x + m}{x + 1} \rightarrow yx + y = x^2 + 5x + m \rightarrow x^2 + (5 - y)x + (m - y) = 0$ برای $\Delta \geq 0$ (یعنی جواب حقیقی برای x نیست و y هم حذف شده پس بر R انیشت) $\Delta = (5 - y)^2 - 4(m - y) = y^2 - 4y + 25 - 4m \geq 0 \rightarrow y^2 - 4y + (25 - 4m) \geq 0$ $\Delta_{\min} \rightarrow y = \frac{-(-4)}{2} = 2 \rightarrow 14 - 4m \geq 0 \Rightarrow 14 - 4m \geq 0$ $m \leq \frac{14}{4} = \frac{7}{2} \Rightarrow \{1, 2, 3, 4\} \quad \text{عدد طبیعی}$	۶
$f(x) = \begin{cases} x + 2; & x \geq 3 \\ x^2 - 2x + 2; & 0 \leq x < 3 \\ x + 2; & x < 0 \end{cases}$ $\rightarrow = -x + 2$ $x_5 = 1, y_5 = 1 + \frac{0}{1} = 1$  $R_f = [1, +\infty)$	۷
$f(x) = \begin{cases} x^2 + 2x + 3; & x \leq 0 \\ [2x] - 2x; & x > 0 \end{cases}$ $\rightarrow x_5 = -2, y_5 = -1$ $-1 < [2x] - 2x \leq 0 \xrightarrow{x > 0} -1 < [2x] - 2x \leq 0$ $\xrightarrow{\text{برداخت}} U \Rightarrow [-1, +\infty)$  $R = [-1, +\infty)$	۸
$y = a + 1 - \sqrt{2x + 3} = b$ $2x + 3 \geq 0 \rightarrow 2x \geq -3 \rightarrow x \geq -\frac{3}{2} \rightarrow [-\frac{3}{2}, +\infty)$ برداخت تابع $\rightarrow a + 1 - \sqrt{2x + 3}$ بیشترین مقدار $a + 1 - \sqrt{2x + 3} = 5 \rightarrow a + 1 = 5$ پایین‌ترین مقدار $a = 4$ $ab = -\frac{3}{2} \times 4 = -6$	۹
$f(x) = 2\sqrt{x+1} + \sqrt{1-x}$ $x \geq -1 \quad x \leq 1 \Rightarrow D_f = [-1, 1]$ $\Rightarrow D_g = D_f = [-1, 1]$ $y(-1) = 2\sqrt{-1+1} - \sqrt{1-(-1)} = \sqrt{2}$ $y(0) = 1 + 2 - 2 = 1$ $y(1) = \sqrt{2} - \sqrt{2} = 0$ $R = [0, \sqrt{2}]$	۱۰