

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

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

$$\left. \begin{aligned} 2g(-1) - 3f(-1) &= 2 - 0 = 2 \\ 2g(0) - 3f(0) &= 8 - 3 = 5 \\ 2g(1) - 3f(1) &= 2 - 0 = 2 \end{aligned} \right\} + = 11 \quad \checkmark$$

$$D_g \cap D_f = \{-1, 0, 1\} \cap [-1, 1] = \{-1, 0, 1\}$$

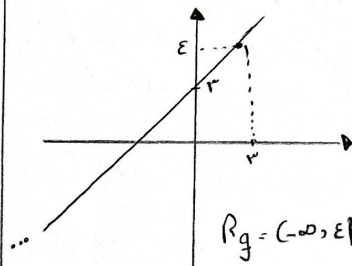
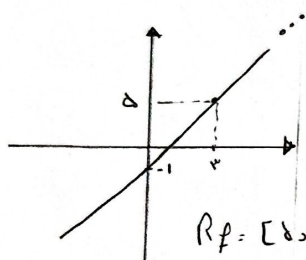
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$$f(x) = 2x - 1$$

$$g(x) = \frac{1}{x}x + 3$$

$$R_f \cup R_g = (-\infty, \infty) \cup (0, \infty)$$



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$$y = \frac{-x^2}{x} + x + 3$$

$$x-2 \left( \frac{-x^2}{x} + x + 3 > \frac{3}{x} \right) \rightarrow x^2 - 2x - 6 < -3 \rightarrow x^2 - 2x - 3 < 0 \rightarrow \frac{-1 \pm \sqrt{1+12}}{2}$$

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

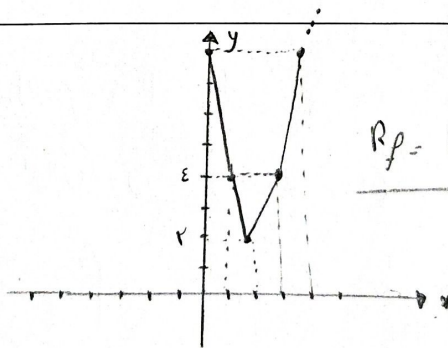
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$$y = |x-1| + |x-2| + |2x-3|$$

$$\begin{array}{c|c|c} 1 & 2 & 3 \\ \hline -x+1 & -x+2 & 2x-3 \end{array}$$

$$\text{if } \begin{cases} x \geq 3 \rightarrow 2x-1 \\ 2 \leq x < 3 \rightarrow 2x-2 \\ 1 \leq x < 2 \rightarrow -x+5 \\ x < 1 \rightarrow -x+4 \end{cases}$$



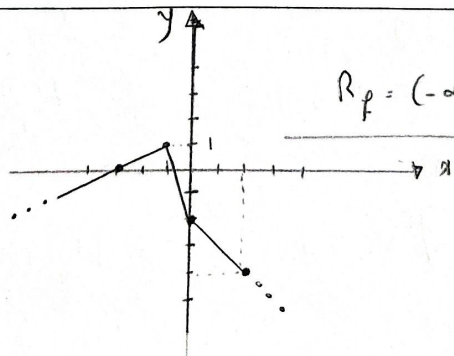
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$$y = |x| - 2|x+1|$$

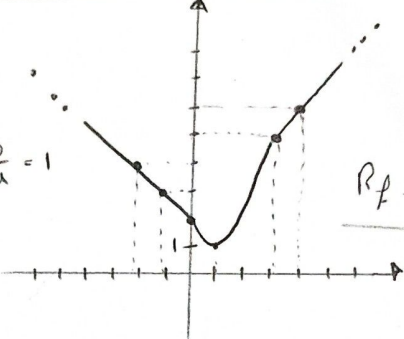
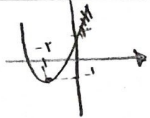
$$\begin{array}{c|c|c} -1 & 0 & \\ \hline x+1 & -x-1 & -x-2 \end{array}$$

$$\text{if } \begin{cases} x \geq 0 \rightarrow -x-2 \\ -1 \leq x < 0 \rightarrow -3x-2 \\ x < -1 \rightarrow x+2 \end{cases}$$



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| $y = \frac{x^2 + \delta x + m}{x+1} \rightarrow xy + y = x^2 + \delta x + m \Rightarrow x^2 + (\delta - y)x + m - y = 0$ $-\delta + y \pm \sqrt{2\delta - y^2 - \varepsilon m + \varepsilon y - 1 - y} \rightarrow \Delta \geq 0 \rightarrow y^2 - 2y + (2\delta - \varepsilon m) \geq 0$ <p>2.1.0 باید <math>A</math> معادله کوچکتر مساوی 0</p> $39 - 10 + 14m \leq 0$ $14m \leq 49 \Rightarrow m \leq \frac{49}{14} = \frac{7}{2}$ <p><math>\hookrightarrow m = \varepsilon \rightarrow \frac{x^2 - \delta x + \varepsilon}{x+1} = x + \varepsilon \xrightarrow{x=-1} \Rightarrow m = 1, 2, 3</math> ✓</p> | <p>2</p> <p>6</p>  |
| $f(x) = \begin{cases} x+2 & ; x \geq 2 \\ x^2 - 2x + 2 & ; 0 \leq x < 2 \rightarrow x_{\min} = \frac{b}{2a} = 1 \\  x  + 2 & ; x < 0 \end{cases}$  <p><math>R_f = [1, +\infty)</math> ✓</p>                                                                                                                                                                                                                                                                                                                                | <p>2</p> <p>7</p>  |
| $f(x) = \begin{cases} x^2 + \varepsilon x + 3 & ; x \leq 0 \rightarrow \textcircled{B} \\ [2x] - 2x & ; x > 0 \rightarrow \textcircled{A} \rightarrow 0 \leq [2x] - 2x < -1 \rightarrow [0, -1) \end{cases}$  <p><math>R_B = [-1, +\infty)</math></p> <p><math>R_T = R_A \cup R_B \Rightarrow R_T = [-1, +\infty) \cup [0, -1) = [-1, +\infty)</math> ✓</p>                                                                                                                                                                 | <p>2</p> <p>8</p>  |
| $y = a+1 - \sqrt{2x+3}$ $2x+3 \geq 0 \Rightarrow 2x \geq -3 \Rightarrow x \geq -\frac{3}{2} \Rightarrow D_f = [-\frac{3}{2}, +\infty) \Rightarrow b = -\frac{3}{2}$ <p><math>a+1 = \delta</math></p> <p><math>a = \varepsilon</math> ✓</p> <p><math>\Rightarrow ab = \varepsilon \times -\frac{3}{2} = -\frac{3\varepsilon}{2}</math> ✓</p>                                                                                                                                                                                                                                                                  | <p>2</p> <p>9</p>  |
| $g(x) = 3\sqrt{2+2\sqrt{1-x^2}} - f(x)$ $\frac{f(x)}{y} = \frac{(3\sqrt{2+2\sqrt{1-x^2}} - f(x))}{3} = \frac{f(x)}{y} + \frac{f(x)}{3} - \sqrt{2+2\sqrt{1-x^2}}$ <p><math>x = \cos t \rightarrow D = [-1, 1] \rightarrow 0 \leq t \leq \pi</math></p> $\sqrt{x+1} + 2\sqrt{1-x} - \sqrt{4+2\sqrt{1-x^2}} = \sqrt{\cos t + 1} + 2\sqrt{1 - \cos t} - \sqrt{4 + 2\sqrt{1 - \cos^2 t}}$ <p><math>R_T = [0, \sqrt{2}]</math> ✓</p>                                                                                                                                                                               | <p>2</p> <p>10</p> |