

۲. آزمون های نوشتاری

$$f(x) = \sqrt{x+4}\sqrt{x-6} = \sqrt{(x-6+2)^2} = \sqrt{x-6} + 2$$

$$g(x) = \sqrt{x-6}\sqrt{x-6} = \sqrt{(x-6-2)^2} = \sqrt{x-6} - 2$$

$$f(x) + g(x) = \sqrt{x-6} + 2 + \sqrt{x-6} - 2 = 2\sqrt{x-6} = a + b\sqrt{x+c}$$

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$$\begin{matrix} a=0 \\ b=2 \\ c=-6 \end{matrix} \quad \frac{a+b}{c} = \frac{2}{-6} = -\frac{1}{3}$$

$$g(x) = \{(2,1), (1,0), (3,0), (0,4)\}$$

$$f(x) = \frac{x+2}{x^2-5x+3} = \frac{x+2}{(x-3)(x-1)}$$

$x \neq 3$
 $x \neq 1$

$$D_f = R - \{1, 3\}$$

$$\frac{g}{f} = \left\{ \left(2, -\frac{1}{6}\right), \left(0, \frac{4}{3}\right) \right\}$$

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$$\frac{1}{\frac{6}{-1}} \quad \frac{4}{\frac{3}{2}}$$

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

$$f(2x) = \left\{ \left(\frac{1}{2}, 2\right), \left(\frac{3}{2}, -1\right), (2, 2), \left(-\frac{1}{2}, 4\right) \right\}$$

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$$f(x^2) = \{(1,2), (-1,2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2,2), (-2,2)\}$$

$$f(x^2) + 1 = \{(-2, 1), (1, 3), (2, 3), (-1, 1)\}$$

$$x^2 = 1 \quad x = \pm 1 \quad x^2 = 3 \quad x = \pm \sqrt{3} \quad x^2 = 4 \quad x = \pm 2$$

$$x^2 = -1 \quad x = \pm i$$

$$x \times 3 = 1 \quad (-1)^2 = 1 \quad 2 \times 2 = 4 \quad 4 = 0$$

$$x \times 2 = 4 \quad 2 \times (-1) = -2 \quad 2 \times 2 = 4 \quad 2 \times 4 = 8$$

$$g) \frac{f}{g} = \{(1, -6), (3, -1), (-1, \frac{4}{3})\}$$

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$$f(x) = \{(2,1), (2,1), (6,9), (-2,0)\} \quad g(x) = \{(0,1), (2,3), (-2,6), (-1,2), (3,3)\}$$

$$f(x) = \{(2,2), (3,2), (6,18), (-2,0)\}$$

$$h(x) = \{(2,5), (3,5), (-2,6)\}$$

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$$f(x) = \frac{\sqrt{4x} - x}{x-2}$$

$$g(x) = [x] + [-x]$$

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$$\left(\frac{f}{g+1}\right)(x) = \frac{\sqrt{4x} - x}{x-2}$$

$$x \neq 2 \quad [x] + [-x] \neq -1$$

$$D\left(\frac{f}{g+1}\right) = \{x \mid 0 \leq x \leq 3, x \neq 2, x \in \mathbb{Z}\}$$

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$$\frac{0}{+6-9+}$$

$$f(x) = \sqrt{x^2 + 5x + 4} \quad g(x) = \{(1, 3), (2, 2), (4, 9), (5, 1)\}$$

$$\downarrow$$

$$\sqrt{-(x^2 - 5x + 4)}$$

$$\downarrow$$

$$\sqrt{(1-x)(x-4)}$$

$$\frac{1}{-b \pm \sqrt{b^2 - 4ac}}$$

$$P_f \Rightarrow [1, 4]$$

$$h(x) = \frac{f}{g} = \left\{ \left(1, \frac{3}{1}\right), \left(2, \frac{1}{2}\right), \left(4, \frac{9}{4}\right), \left(5, \frac{1}{5}\right) \right\}$$

$$f(1) = 0$$

$$f(2) = \sqrt{2}$$

$$f(4) = 0$$

$$y = x^3 - 2x^2 + 3x \rightarrow y = x^3 - 2x^2 + 3x + 1 - 1$$

$$y = (x-1)^3 + 1$$

$$\frac{y-1}{3} = (x-1)$$

$$\sqrt[3]{y-1} = x-1$$

$$x = \sqrt[3]{y-1} + 1$$

$$y = \frac{1}{x^2 - 2x}$$

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$$yx^2 - 2yx - 1 = 0$$

$$y \neq 0 \rightarrow x = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y}$$

$$4y^2 + 4y \geq 0$$

$$4y(y+1) \geq 0$$

$$\frac{-1}{4} \leq y \leq 0$$

$$g \rightarrow [-\infty, -1] \cup (0, +\infty)$$

$$الف) y = x^2 - 4x + 1$$

$$راس) \left\{ \begin{aligned} \frac{-b}{2a} &= \frac{4}{2} = 2 \\ \Delta & \min \end{aligned} \right. \quad g \rightarrow [4, +\infty)$$

$$ب) y = -x^2 + 4x + 3$$

$$راس) \left\{ \begin{aligned} \frac{-b}{2a} &= \frac{-4}{-2} = 2 \\ \Delta & \max \end{aligned} \right. \quad g \rightarrow (-\infty, 12]$$

$$ج) y = \sqrt{x^2 - 4x + 4}$$

$$راس) \left\{ \begin{aligned} \frac{-b}{2a} &= \frac{4}{2} = 2 \\ \Delta & \min \end{aligned} \right. \quad \sqrt{[-4, +\infty)} \rightarrow g \rightarrow [0, +\infty)$$

$$د) y = \sqrt{-x^2 + 4x}$$

$$راس) \left\{ \begin{aligned} \frac{-b}{2a} &= \frac{-4}{-2} = 2 \\ \Delta & \max \end{aligned} \right. \quad \sqrt{(-\infty, 4]} \rightarrow g \rightarrow [0, 4]$$

$$الف) y = x^3 - 5x^2 + 2x + 1 \rightarrow \text{بزرگترین توان فرد} \rightarrow g \rightarrow \mathbb{R}$$

$$ب) y = x^4 - 4x^3 + 3x^2 + 2 \rightarrow \text{بزرگترین توان فرد} \rightarrow g \rightarrow \mathbb{R}$$

$$ج) y = \sqrt{x^4 - 4x^3 + 5x^2 + 1} \rightarrow \text{بزرگترین توان فرد} \rightarrow g \rightarrow \sqrt{\mathbb{R}} \rightarrow [0, +\infty)$$

$$د) y = (x^5 - 4x^4 + 3x^3 + 1)^2 \rightarrow \text{بزرگترین توان فرد} \rightarrow g \rightarrow (\mathbb{R})^2 \rightarrow [0, +\infty)$$

$$الف) y = \frac{3x+1}{x-2} \quad x = -\frac{-2y-1}{y-3} = \frac{2y+1}{y-3} \quad g \rightarrow (\mathbb{R} - \{3\})$$

$$ب) y = \frac{2x+1}{x+1} \quad x = -\frac{y-1}{y-2} = \frac{1-y}{y-2} \quad g \rightarrow (\mathbb{R} - \{2\})$$