

$$\begin{cases} g(x) = \sqrt{x-4} \sqrt{x-4} \xrightarrow{\text{ساده کنیم}} \sqrt{(\sqrt{x-4}-2)^2} \rightarrow \sqrt{x-4} - 2 \\ f(x) = \sqrt{x+4} \sqrt{x-4} \xrightarrow{\text{ساده کنیم}} \sqrt{(\sqrt{x-4}+2)^2} \rightarrow \sqrt{x-4} + 2 \end{cases}$$

$$\begin{aligned} \star f(x) + g(x) &= a + b\sqrt{x+c} \\ \hookrightarrow A-2 + A+2 &= 2A \rightarrow 2\sqrt{x-4} \end{aligned} \quad \left. \begin{aligned} a=0 / b=2 / c=-4 \\ \star \frac{a+b}{c} = \frac{2}{-4} = -\frac{1}{2} \end{aligned} \right\} \sim \text{ج}$$

$$f(x) = \frac{x+2}{x^2-x+3} \xrightarrow{\text{تجزیه کنیم}} \frac{x+2}{(x-1)(x-3)} \xrightarrow{\text{تجزیه کنیم}} \frac{1}{x-1} - \frac{1}{x-3} \quad (-\infty, 1) \cup (3, +\infty) : \text{دامنه}$$

$$\begin{aligned} g(x) &= \left\{ \left( \frac{1}{2}, 1 \right), (1, 0), (3, 0), (0, 6) \right\} \\ \hookrightarrow f(2) &= \frac{4}{1 \cdot (-1)} = -4 / f(0) = \frac{2}{(-1) \cdot (-3)} = \frac{2}{3} \end{aligned} \quad \left. \begin{aligned} \frac{f}{g} &= \left\{ \left( 2, \frac{1}{2} \right), (0, 6) \right\} \\ \text{در این جا} & \end{aligned} \right\} \sim \text{ج}$$

$$2x=1 \rightarrow x=\frac{1}{2} / 2x=3 \rightarrow x=\frac{3}{2} / 2x=4 \rightarrow x=2 / 2x=-1 \rightarrow x=-\frac{1}{2}$$

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

$$\text{ب) } f(x^2) = \left\{ (1, 2), (-1, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2, 2), (-2, 2) \right\} \quad x^2 = \frac{x}{x^2} \rightarrow x^2 = 1 \rightarrow x = \pm 1 / x^2 = 3 \rightarrow x = \pm \sqrt{3} / x^2 = 4 \rightarrow x = \pm 2$$

$$\text{ج) } 2g^2(x) + 1 = \left\{ (-2, 19), (1, 3), (3, 9), (-1, 1) \right\} \quad 2 \times 9 + 1 = 19 / 2 \times 1 + 1 = 3 / 2 \times 3 + 1 = 9 / 2 \times 0 + 1 = 1$$

$$\text{د) } \frac{2f}{g} = \left\{ (1, -4), (3, -1), \left( -\frac{1}{2}, -4 \right) \right\} \rightarrow \left\{ (1, -4), (3, -1) \right\} \quad \frac{2 \times 2}{-1} = -4 / \frac{2 \times 1}{3} = -\frac{2}{3} / \frac{2 \times 0}{0} = \frac{2}{0}$$

$$2 \times 1 + 3 = 5 / 2 \times 1 + 3 = 5 / 2 \times 0 + 6 = 6 / \quad \text{مقادیر } 2, 3, -2$$

$$h = 2f + g = \left\{ (2, 5), (3, 5), (-2, 6) \right\} \sim \text{ج}$$

$$g(x) = [x] + [-x] \quad \begin{cases} x \notin \mathbb{Z} \rightarrow g(x) = -1 \\ x \in \mathbb{Z} \rightarrow g(x) = 0 \end{cases} \Rightarrow \text{درمجموعه } h \text{ تابع } g+1 \rightarrow g(x) = -1 \rightarrow -1+1=0 \text{ ن.ن.}$$

$$f(x) = \frac{\sqrt{3x-x^2}}{x-2} \xrightarrow{\text{تجزیه کنیم}} \begin{cases} 1. \sqrt{3x-x^2} \geq 0 \rightarrow x \in [0, 3] \\ 2. \sqrt{3x-x^2} > 0 \rightarrow x \in (0, 3) \\ 3. x-2 \neq 0 \rightarrow x \neq 2 \end{cases} \quad \begin{aligned} & \text{دامنه } [0, 3] - \{2\} \\ & \text{مقادیر } 1, 2, 3 \end{aligned}$$

$$\star D\left[\frac{f}{g+1}\right] = \left\{ \frac{0}{1} = 0, \frac{1}{1} = 1, \frac{3}{1} = 3 \right\} \sim \text{ج}$$

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