

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

$$|\sqrt{x-4} - 2| + |\sqrt{x-4} + 2| \xrightarrow{x > 4} 2\sqrt{x-4} + 0$$

$$\frac{a+b}{c} = \frac{0+2}{-4} = -\frac{1}{2}$$

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$$\frac{g}{f}(x) = \left\{ \left(2, \frac{-1}{2} \right) \text{ و } (0, 4) \right\}$$

برای $n=2$ تعریف می شود

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$$الف) f(2x) = \left\{ \left(\frac{1}{2}, 2 \right), (1, 5), (2, 2), \left(\frac{-1}{2}, 6 \right) \right\}$$

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

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

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

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$$h(x) = \left\{ (2, \omega), (-2, 4), (3, \omega) \right\}$$

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$$g(x) \neq 0 \Rightarrow x \in \mathbb{Z} \quad ① \quad ① \cap ② \cap ③ \cap ④ = \{0, 1, 3\}$$

$$3x \geq 0 \Rightarrow x \geq 0 \quad ②$$

$$\sqrt{3x} - x \geq 0 \quad \frac{0}{-} + \frac{3}{-} = \quad [0, 3] \quad ③$$

$$x \neq 2 \quad ④$$

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$$h(n) = \{(1, 0), (2, 4), (4, 0)\}$$

1, 15

$$f(r) = \sqrt{1 - 4 - 4} = \sqrt{2}$$

$$g(r) = 2 \rightarrow \frac{f}{g}(r) = \frac{\sqrt{2}}{2}$$

برای $n=5$ تعریف نمی شود.

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$$\text{الف) } y = (n-1)^3 + 1 \Rightarrow n-1 = \sqrt[3]{y-1} \Rightarrow n = \sqrt[3]{y-1} + 1$$

$$R_f = \mathbb{R}$$

$$(n-1)^3 = \sqrt[3]{\frac{y+1}{y}} \rightarrow \frac{-1}{+1-1+}$$

1, 5

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$$\text{ب) } \frac{1}{y} = (n-1)^2 - 1 \Rightarrow \frac{y+1}{y} = (n-1)^2 \Rightarrow \sqrt{\frac{y+1}{y}} = n-1 \Rightarrow$$

چرا تا اینجا؟ از دو طرف جذر گرفتیم!

$$n = \frac{\sqrt{y+1}}{\sqrt{y}} + 1 \quad y > -1 \quad y > 0 \quad R_f = [0, \infty) \quad \mathbb{R} \neq (-1, +\infty)$$

$$\text{الف) } R_f = \left[-\frac{\Delta}{4a}, \infty\right) = [9, \infty)$$

$$\text{ب) } R_f = \left(-\infty, -\frac{\Delta}{4a}\right] = (-\infty, 12]$$

$$\text{ج) } R_f = \sqrt{\left[-\frac{\Delta}{4a}, \infty\right)} = \sqrt{[-7, \infty)} = [0, \infty)$$

$$\text{د) } R_f = \sqrt{\left(-\infty, -\frac{\Delta}{4a}\right]} = \sqrt{(-\infty, 9]} = [0, 3]$$

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$$\text{الف) } R_f = \mathbb{R}$$

$$\text{ب) } R_f = \mathbb{R}$$

$$\text{ج) } R_f = \sqrt{\mathbb{R}} = [0, \infty)$$

$$\text{د) } R_f = \mathbb{R}^2 = [0, \infty)$$

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$$\text{الف) } \mathbb{R} - \left\{\frac{a}{c}\right\} = \mathbb{R} - \{3\}$$

$$\text{ب) } \mathbb{R} - \left\{\frac{c}{a}\right\} = \mathbb{R} - \{2\}$$

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(الف) $y = n^3 - 3n^2 + 2n - 1 + 1 = y = (n-1)^3 + 1$ (۷)

$$y-1 = (n-1)^3 \rightarrow \sqrt[3]{y-1} = n-1 \rightarrow n = \sqrt[3]{y-1} + 1$$

$R_f = \mathbb{R}$

(ب) $y = \frac{1}{n^2 - 2n} \rightarrow n^2 y - 2n y = 1 \rightarrow n^2 y - 2n y - 1 = 0$

$y \neq 0 \rightarrow n = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y} \rightarrow 4y(y+1) \geq 0 \rightarrow \frac{-1}{+} \frac{0}{+}$

$y = 0 \rightarrow 0 = 1 \times$ حقیقی وجود ندارد! $\rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$

$D_f \rightarrow \Delta n - n^2 - 2 \geq 0 \rightarrow n^2 - \Delta n + 2 \leq 0 \rightarrow 1 \leq n \leq 2$ (۹)

$D_f \cap D_g = \{1, 2\}$

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