

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

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

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

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

برای  $n=2$  تعریف می شود

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

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

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

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

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

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

$$3x > 0 \Rightarrow x > 0 \quad (2)$$

$$\sqrt{3x} - x > 0 \quad \frac{0}{-1} + \frac{3}{-1} = -3 \quad [0, 3] \quad (3)$$

$$x \neq 2 \quad (4)$$

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

برای  $n=5$  تعریف نمی شود.

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

$$R_f = \mathbb{R}$$

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

$$n = \frac{\sqrt{y+1}}{\sqrt{y}} + 1 \quad \begin{matrix} y > -1 \\ y > 0 \end{matrix} \quad R_f = [0, \infty)$$

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

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

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

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

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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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