

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

$$= 2\sqrt{x-4} \quad \begin{cases} a=0 \\ b=2 \\ c=-4 \end{cases}$$

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

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

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

$$f(2) = \frac{4}{4-8+3} = -4$$

$$f(1) = \frac{3}{1-4+3} = \text{ت.ج}$$

$$f(3) = \frac{5}{9-12+3} = \frac{5}{0} = \text{ت.ج}$$

$$f(0) = \frac{2}{0-0+3} = \frac{2}{3}$$

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

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

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

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

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$$2f = \left\{ (2, 2) \text{ و } (3, 2) \text{ و } (4, 18) \text{ و } (-2, 0) \right\}$$

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

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$$\text{اگر } x \text{ صحیح باشد} \rightarrow g(x) = 0$$

$$g+1 \neq 0$$

$$x \neq -1$$

$$\text{اگر } x \text{ صحیح نباشد} \rightarrow g(x) = -1$$

$$f(x) = \frac{\sqrt{3x-x}}{x-2}$$

$$\begin{cases} 3x-x^2 \geq 0 \\ x(3-x) \geq 0 \end{cases} \rightarrow 0 \leq x \leq 3$$

$$D = \{3 \text{ و } 0\}$$

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$$f(x) = \{(1, 0) \text{ و } (2, \sqrt{2}) \text{ و } (4, 0) \text{ و } (\cancel{5}, \cancel{0})\}$$

$$h(x) = \frac{f(x)}{g(x)} = \{(1, 0) \text{ و } (2, \frac{\sqrt{2}}{1}) \text{ و } (4, 0)\}$$

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الف) $R_y = \mathbb{R}$
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ب) $y = \frac{1}{x^2 - 2x}$
 $(x-1)^2 - 1$
 $(x-1)^2 > 0 \rightarrow x^2 - 2x - 1 > 0 \rightarrow x^2 - 2x \geq 1 \xrightarrow{\text{مفروضه}} [-1, 0) \cup (0, \infty) \rightarrow R = (-\infty, -1] \cup (0, \infty)$

الف) $y = x^2 - 4x + 10 \rightarrow y = (x-2)^2 + 6 \rightarrow R_y = [6, +\infty)$

ب) $y = -x^2 + 4x + 3 \rightarrow y = -(x-2)^2 + 11 \rightarrow R_y = (-\infty, 11]$

ج) $y = \sqrt{x^2 - 4x + 3} \rightarrow R_y = [0, +\infty)$

د) $y = \sqrt{4x - x^2} = \sqrt{4 - (x-2)^2} \xrightarrow{[0, 4]} R_y = [0, 2]$

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الف) $R_f = \mathbb{R}$

ب) $R_f = \mathbb{R}$

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

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

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الف) $R_f = \mathbb{R} - \{3\}$

ب) $R_f = \mathbb{R} - \{2\}$

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