

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

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

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

$$\frac{g}{f} = \left\{ \left(2, -\frac{1}{4} \right) \text{ و } (0, 9) \right\} \quad \text{د}$$

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

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

$$f(1) = \frac{3}{1-4+3} = \text{ت}$$

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

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

$$f(2x) = \left\{ \left(\frac{2}{3}, 2 \right) \text{ و } \left(\frac{2}{3}, -1 \right) \text{ و } \left(-\frac{1}{3}, 9 \right) \right\} \quad u^2 = 3 \rightarrow u = \pm\sqrt{3}$$

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

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

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

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

$$h = 2f + g \Rightarrow \left\{ (2, 5) \text{ و } (3, 5) \text{ و } (4, 9) \right\} \quad \text{د}$$

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

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

$$D = \{ 0, 3 \}$$

$$g+1 \neq 0$$

$$x \neq -1$$

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

$$\boxed{x \neq 2}$$

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

$$\text{د} \quad \text{د}$$

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

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

بر روی محور باید به روش اعلان بدست بیایید! $R_y = \mathbb{R}$ (الف)
تابع درجه فرد

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

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

الف) $R_f = \mathbb{R}$

ب) $R_f = \mathbb{R}$

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

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

الف) $R_f = \mathbb{R} - \{3\}$

ب) $R_f = \mathbb{R} - \{2\}$

$$f(x) = \left\{ \left(\frac{1}{x}, 2 \right) \left(\frac{x}{2}, -1 \right) (2, 2) \left(-\frac{1}{x}, 4 \right) \right\} \quad x \text{ های } f \text{ باید حقیق برابر شوند!} \quad (۳)$$

$$f(x) = \left\{ (1, 2) (-1, 2) (\sqrt{x}, -1) (-\sqrt{x}, -1) (2, 2) (-2, 2) \right\} \quad \text{هر کدام از } x \text{ های } f \text{ را برابر } x^2 \text{ قرار دهیم!}$$

$$g^2(x) + 1 = \left\{ (-2, 19) (1, 3) (3, 9) (-1, 1) \right\} \quad \text{این عمل روی } y \text{ های و اعمال میشود:}$$

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

$$(الف) \quad y = x^3 - 3x^2 + 2x - 1 + 1 = y = (x-1)^3 + 1 \quad (۷)$$

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

$$R_f = \mathbb{R}$$

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

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

$$y = 0 \rightarrow 0 = 1 \quad x \text{ حقیقی وجود ندارد!} \rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$$