

$$x=8 \rightarrow g(x)=2\sqrt{x} \quad f(x)=4$$

$$4+2\sqrt{x}=a+b\sqrt{8+c}$$

$$a=4 \quad b=2$$

$$8+c=2 \rightarrow c=-4$$

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

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$$x=2 \rightarrow \frac{2+2}{2-8+3} = \frac{4}{-1} = -4$$

$$x=1 \rightarrow \frac{1+2}{1-8+3} = \frac{3}{-4} = -\frac{3}{4}$$

$$x=3 \rightarrow \frac{3+2}{9-14+3} = \frac{5}{-2} = -\frac{5}{2}$$

$$x=0 \rightarrow \frac{0+2}{0-8+3} = \frac{2}{-5} = -\frac{2}{5}$$

$$f(x) = (2, -4) \left(0, -\frac{2}{5}\right)$$

$$\frac{g(x)}{f(x)} = \left(2, -\frac{1}{4}\right) \left(0, -\frac{2}{5}\right)$$

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الف) $\left(\frac{1}{4}, 2\right) \left(\frac{3}{4}, -1\right) (2, 2) \left(-\frac{1}{4}, 4\right)$

ب) $(1, 2) (-1, 2) (\sqrt{3}, -1) (2, 2) (-2, 2) \left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

ج) $f(-1)^2+1=3 / f(2)^2+1=9 / f(2)^2+1=9 / f(1)^2+1=1 \rightarrow \left\{(-2, 1) (1, 3) (2, 9) (-1, 1)\right\}$

د) $2f = (1, 4) (3, -2) (4, 4) (-1, 12) \quad \frac{2f}{g} = (1, -4) (3, -1) \left(-\frac{1}{2}, \frac{3}{2}\right)$

الف) $2f = (2, 2) (3, 2) (4, 18) (-2, 0)$

ب) $2f+g = (2, 5) (3, 5) (-2, 4)$

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$$f(x) = \frac{\sqrt{x}-x}{x-2} \quad g(x) = [x] + [-x] \quad D = \left(\frac{f}{g+1}\right)(x)$$

$$\sqrt{x}-x > 0 \rightarrow \sqrt{x} > x \rightarrow D_f = [0, 1] \rightarrow x \neq 2$$

$$g(x) = [x] + [-x] \xrightarrow{-1 \leq -x \leq 0} 0 + (-1) = -1 \rightarrow g(x)+1=0 \rightarrow \text{خط}$$

$$x=0 \rightarrow 0 \text{ قس } \quad x=1 \rightarrow 1-1=0 \text{ قس } \rightarrow D = \{0, 1\}$$

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$f(1) = 0$ $f(2) = \sqrt{2}$ $f(4) = 0$ $f(0) = 0$ $f(u) = [(1, 0), (2, \sqrt{2}), (4, 0)]$	$\frac{f(u)}{g(u)} = \left\{ (1, 0), (2, \frac{\sqrt{2}}{2}), (4, 0) \right\}$	6
الف) $y = (x-1)^3 + 1 \rightarrow \sqrt[3]{y-1} = x-1 \rightarrow R_f = \mathbb{R}$ $\rightarrow yx^3 - 3xy - 1 = 0 \rightarrow x = \frac{3y \pm \sqrt{9y^2 + 4y}}{3y}, y \neq 0$ $R_f = (-\infty, 0] \cup [0, +\infty)$	$y(y+1)$	7
الف) $\min \frac{y}{4} \rightarrow [4, +\infty)$ $\rightarrow \max \frac{y}{12} \rightarrow (-\infty, 12]$ ج) $\min \frac{y}{-1} \rightarrow \sqrt{[-1, +\infty)} \rightarrow [0, +\infty)$ د) $\min \frac{y}{9} \rightarrow \sqrt{[9, +\infty)} \rightarrow [3, +\infty)$		8
الف) $\mathbb{R}$ $\rightarrow \mathbb{R}$ $g = \sqrt{x} \rightarrow [0, +\infty)$ د) چون بدان $[0, +\infty)$ $\sqrt{x}$ گزیده		9
الف) $R_f = \mathbb{R} - \{2\}$ $\rightarrow R_f = \mathbb{R} - \{2\}$		10