

$$\begin{aligned} f(x) &= \sqrt{(\sqrt{x-1}+1)^2} = \sqrt{x-1} + 1 \\ g(x) &= \sqrt{(\sqrt{x-1}-1)^2} = \sqrt{x-1} - 1 \end{aligned} \Rightarrow f(x) + g(x) = \sqrt{x-1} + 1 + \sqrt{x-1} - 1 = 2\sqrt{x-1} \quad (1)$$

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

$$f(x) = \frac{x+2}{(x-1)(x-2)} \quad 1 \times \quad 2 \times \quad 2 \checkmark \quad 0 \checkmark \quad (2)$$

$$\frac{g(2)}{f(2)} = \frac{1}{-1}, \quad \frac{g(0)}{f(0)} = \frac{1}{2} = \frac{1}{2}$$

$$2x=1, 2, 1, -1 \Rightarrow x = \frac{1}{2}, 2, 1, -1 \Rightarrow f(x) = \left\{ \left(\frac{1}{2}, 2 \right), (2, 1), (1, 2), \left(-1, \frac{1}{2} \right) \right\} \quad (3)$$

$$x^2=1, 2, 1, -1 \Rightarrow x = 1, \sqrt{2}, 2, -1 \Rightarrow f = \left\{ (1, 2), (\sqrt{2}, -1), (2, 2), (-1, 2), (-2, 2), (-\sqrt{2}, -1) \right\} \quad (4)$$

$$2g(x)+1 = \{(-2, 1), (1, 2), (2, 1), (-1, 1)\} \quad (5)$$

$$\frac{f}{g} = \left\{ (1, -1), (2, -1), \left(-1, \frac{1}{2} \right) \right\} \quad (6)$$

$$h = f + g \Rightarrow h = \{(2, 0), (2, 0), (-2, 1)\} \quad (7)$$

$$D_f \Rightarrow x \geq 0 \rightarrow \sqrt{2x} - x \geq 0 \Rightarrow \sqrt{2x} \geq x \Rightarrow 2x \geq x^2 \Rightarrow x(2-x) \geq 0 \quad (8)$$

$$D_f = [0, 2] - \{2\} \quad D_g = 1, 2, 3, -1, 0$$

$$D_{fg} = (1, 2, 0)$$

$$\sqrt{x^2+2x-1} \Rightarrow x = 1, 2, 1 \quad (9)$$

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

$$y = x^2 - 2x^2 + 2x = (x-1)^2 + 1 \Rightarrow R_f = [1, \infty) \quad (10)$$

$$x^2 - 2x = (x-1)^2 - 1 \Rightarrow R_f = (-\infty, -1] \cup (0, +\infty) \quad (11)$$

$$R_f = -\frac{14 - 40}{4} = \frac{26}{4} = 6.5 \Rightarrow R_f = [6.5, +\infty) \quad (الف)$$

$$R_f = -\frac{26 + 12}{-4} = \frac{38}{4} = 9.5 \Rightarrow R_f = (-\infty, 9.5] \quad (ب)$$

$$R_f = -\frac{14 + 12}{4} = -\frac{26}{4} = -6.5 \Rightarrow R_f = [0, +\infty) \quad (ج)$$

$$R_f = -\frac{26}{-4} = 6.5 \Rightarrow R_f = [0, 6.5] \quad (د)$$

$$R_f = \mathbb{R} \quad (هـ)$$

$$R_f = \mathbb{R} \quad (ب)$$

$$R_f = [0, +\infty) \quad (ج) \quad \text{چون جواب امکان می‌تواند منفی باشد}$$

$$R_f = [0, +\infty) \quad (د) \quad \text{چون توان دو دارد منفی می‌شود}$$

$$\frac{c}{a} = 3 \Rightarrow R_f = \mathbb{R} - \{3\} \quad (الف)$$

$$\frac{c}{a} = 2 \Rightarrow R_f = \mathbb{R} - \{2\} \quad (ب)$$