



$$f(x) + g(x) = a + b\sqrt{x+c}$$

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

$$= \sqrt{((\sqrt{x-4})+2)^2} \quad | \sqrt{x-4} + 2 | + | \sqrt{x-4}-2 | = 2\sqrt{x-4} \Rightarrow a=0 \quad c=-4 \quad b=2 \quad \frac{2}{-4} = -\frac{1}{2}$$

$$(2, \frac{2+2\sqrt{4}}{4-1+4}) (1, \frac{1+2\sqrt{1}}{1-1+1}) (3, \frac{3+2}{9-1+9}) (0, \frac{0+2}{0-0+2})$$

$$(2, -4) (0, \frac{2}{4})$$

$$\frac{g}{f} \Rightarrow (2, -\frac{1}{4}) (0, \frac{1\sqrt{4}}{4})$$

$$f(x) = \frac{x+2}{x^2-4x+4} \Rightarrow x \neq 1, 3$$

$$g(x) = \{ (2, 1) (1, 0) (3, \infty) (0, 2) \}$$

$$f(2x) = \{ (\frac{1}{2}, 4) (\frac{3}{2}, -1) (\frac{5}{2}, 2) (-\frac{1}{2}, 2) \}$$

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

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

$$\frac{2f}{g} = \{ (1, -4) (3, -1) (-1, 2) \}$$

$$h = 2f + g$$

$$\{ (2, 2(1)+3) (-2, 2(0)+4) (3, 2(1)+3) \}$$

$$\{ (2, \infty) (-2, 4) (3, \infty) \}$$

$$g+1 \neq$$

$$g \neq -1$$

$$g(x) \rightarrow -1 \text{ در } x=0 \rightarrow |R-Z$$

بسیار نزدیک به 1 نیست

$$f(x) \rightarrow x \neq 2$$

$$x \neq 0 \quad \sqrt{x^2-x}$$

$$\sqrt{x^2-x} \geq 0 \quad \leftarrow$$

$$\sqrt{x^2-x} \geq 0 \Rightarrow x^2-x \geq 0 \Rightarrow x(x-1) \geq 0 \Rightarrow x \leq 0 \text{ یا } x \geq 1$$

$$Df = \{ 0, 1, 3 \}$$

$$x^2-3x \leq 0 \quad x(x-3) \leq 0$$

$$f(x) = \{ (1, \sqrt{1-1-4}) (2, \sqrt{4-4-4}) (4, \sqrt{16-16-4}) (0, \sqrt{0-0-4}) \}$$

$$\Rightarrow f(x) = \{ (1, 0) (2, \sqrt{4}) (\sqrt{4}, 0) \}$$

$$h(x) = \{ (1, \frac{0}{4}) (2, \sqrt{\frac{4}{4}}) (4, \frac{0}{4}) \} \Rightarrow h(x) = \{ (1, 0) (2, \sqrt{\frac{4}{4}}) \}$$

$$(4, 0) \}$$

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

الف) $y = x^3 - 3x^2 + 3x - 1 + 1$

جواب السؤال الثاني: لا مجال لأن $R_f = \mathbb{R}$

$$y - 1 = (x-1)^3 \Rightarrow x-1 = \sqrt[3]{y-1} \Rightarrow x = \sqrt[3]{y-1} + 1 \Rightarrow R_f = \mathbb{R}$$

ج) $yx^2 - 2yx = 1 \Rightarrow yx^2 - 2yx - 1 = 0 \Rightarrow 4y^2 + 4y \geq 0 \Rightarrow y \geq 0$

$$f_y(0,1) = 0 \Rightarrow \frac{-1}{+4-0} = \frac{0}{+4-0}$$

$$R_f = [-\infty, +\infty]$$

الف) $\frac{-b}{2a} = \frac{-(-4)}{2(1)} = 2 \Rightarrow 4 - 1 + 1 = 4 \Rightarrow a \geq 0 \Rightarrow \text{Min} \Rightarrow R_f = [4, +\infty)$

ج) $\frac{-b}{2a} = \frac{-(-4)}{2(1)} = 2 \Rightarrow -9 + 18 + 3 = 12 \Rightarrow a \geq 0 \Rightarrow \text{Min} \Rightarrow R_f = (-\infty, 12]$

ج) $\frac{-b}{2a} = \frac{-(-4)}{2(1)} = 2 \Rightarrow 4 - 1 - 3 = 0 \Rightarrow R_f = [0, +\infty)$

ج) $\frac{-b}{2a} = \frac{-(-4)}{2(1)} = 2 \Rightarrow 4 - 1 - 9 = -6 \Rightarrow R_f \rightarrow [0, 3]$

الف) $\mathbb{R}$ ج) $\mathbb{R}$ ج) $[0, +\infty)$ ج) $[0, +\infty)$

الف) $\mathbb{R} - \{3\}$ ج) $\mathbb{R} - \{2\}$