

$$f(n) = \sqrt{n+2} \sqrt{n-2} = \sqrt{n^2 - 4} = \sqrt{(n-2)(n+2)} = \sqrt{(n-2)^2 + 4} = \sqrt{n^2 - 4 + 4} = \sqrt{n^2} = |n| = n \quad (n \geq 2)$$

$$g(n) = \sqrt{n-2} \sqrt{n+2} = \sqrt{n^2 - 4} = \sqrt{(n+2)(n-2)} = \sqrt{(n+2)^2 - 4} = \sqrt{n^2 + 4 - 4} = \sqrt{n^2} = |n| = n \quad (n \geq 2)$$

$$f(n) + g(n) = \sqrt{n-2} + \sqrt{n+2} - 2 = 2\sqrt{n-2} = a + b\sqrt{n+c} \quad \begin{cases} a=0 \\ b=2 \\ c=-2 \end{cases}$$

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

$$f(n) = \frac{n+2}{(n-1)(n-3)} \rightarrow f(1) = \frac{3}{-2} = -\frac{3}{2}$$

$$f(1) = \frac{3}{-2} \rightarrow \text{نقطه}$$

$$f(3) = \frac{5}{0} \rightarrow \text{نقطه}$$

$$f(5) = \frac{7}{-4} = -\frac{7}{4}$$

$$\left\{ \begin{array}{l} \frac{g}{f}(1) = -\frac{1}{2} \\ \frac{g}{f}(3) = 4 \end{array} \right\} \Rightarrow \left\{ (1, -\frac{1}{2}), (3, 4) \right\}$$

$$f(n) = \left\{ \left(\frac{1}{2}, 2 \right), \left(\frac{3}{2}, -1 \right), \left(\frac{5}{2}, 2 \right), \left(\frac{7}{2}, -1 \right) \right\} \rightarrow \text{مجموعه اول}$$

$$f(n^2) = \left\{ \begin{array}{l} n^2 = 1 \rightarrow n = \pm 1 \\ n^2 = 4 \rightarrow n = \pm 2 \end{array} \right\} \Rightarrow \left\{ (1, 2), (-1, 2), (2, -1), (-2, -1) \right\}$$

$$g(n) = \left\{ (-2, 1), (2, 3), (4, 9), (-4, 1) \right\}$$

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

$$h(n) = f(n) + g(n) \rightarrow g, f \text{ مستقر در } n = -2, 2, 4$$

$$\Rightarrow \left\{ (-2, 4), (2, 4), (4, 4) \right\}$$

$$\left(\frac{f}{g} \right)(n) = \frac{\sqrt{n^2 - n}}{n-2} \rightarrow \sqrt{n^2 - n} \geq 0 \rightarrow n^2 - n \geq 0 \rightarrow n(n-1) \geq 0 \rightarrow n \in (-\infty, 0] \cup [1, \infty)$$

$$[n] = [-n] + 1 \rightarrow n \geq 0 \rightarrow n \geq 0, n \neq 1$$

$$\text{if } n \in \mathbb{Z} \rightarrow [n] + [-n] = -1 \rightarrow \text{مجموعه مضرب های فرد}$$

$$\text{if } n \in \mathbb{Z} \rightarrow [n] + [-n] = 0 \rightarrow n \in \mathbb{Z}$$

$$n \rightarrow D = \{0, 1, 3\}$$

$$f(n) = \sqrt{-n^2 + 2n - 2} = \sqrt{-(n-1)(n+2)} \rightarrow -(n-1)(n+2) \geq 0 \rightarrow \frac{-2}{-1} + \frac{1}{-}$$

$$\rightarrow n \neq -2, -1, 0$$

$$h(n) = \left\{ (1, 0), (2, 0), \left(3, \frac{\sqrt{3}}{2} \right) \right\}$$

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$$\text{a)} y = x^2 - 4x^2 + 4x \rightarrow y = x^2 - 4x^2 + 4x + 1 - 1 \rightarrow (x-1)^2 + 1 \rightarrow x = \sqrt{y-1} + 1 \rightarrow R_f = \mathbb{R}$$

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

$$\rightarrow \frac{-1}{2} \pm \frac{0}{2} \rightarrow R_f = [-\infty, -1] \cup (0, +\infty)$$

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$$\text{a)} y = x^2 - 4x^2 + 4x \rightarrow \min |y| \rightarrow R_f = [4, +\infty)$$

$$\rightarrow y = -x^2 + 4x + 4 \rightarrow \max |y| \rightarrow R_f = (-\infty, 12]$$

$$\text{b)} y = x^2 - 4x^2 + 4x \rightarrow \min |y| \rightarrow R_f = \sqrt{[-4, +\infty)} = [0, +\infty)$$

$$\text{c)} y = \sqrt{4x - x^2} \rightarrow \max |y| \rightarrow R_f = \sqrt{[-\infty, 4]} = [0, 2]$$

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$$\text{a)} y = x^2 - 4x^2 + 4x \rightarrow \text{بالتقريب قول عبارات غير} \rightarrow R_f = \mathbb{R}$$

$$\rightarrow y = x^2 - 4x^2 + 4x \rightarrow \text{بالتقريب قول عبارات غير} \rightarrow R_f = \mathbb{R}$$

$$\text{b)} y = \sqrt{x^2 - 4x^2 + 4x} \rightarrow \text{بالتقريب قول عبارات غير} \rightarrow R_f = \sqrt{\mathbb{R}} = [0, +\infty)$$

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$$\text{c)} y = \left(\frac{4x^2 + 4x + 1}{x} \right)^2 \rightarrow R_f = [0, +\infty)$$

$$\text{a)} y = \frac{4x+1}{x-2} \rightarrow \mathbb{R} - \left\{ \frac{1}{2} \right\} \rightarrow R_f = \mathbb{R} - \left\{ \frac{1}{2} \right\}$$

$$\rightarrow y = \frac{4x+1}{x-2} \rightarrow \mathbb{R} - \left\{ \frac{1}{2} \right\} \rightarrow R_f = \mathbb{R} - \left\{ \frac{1}{2} \right\}$$

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