

$$f(x) = \sqrt{x+t\sqrt{x-t}} \quad , \quad g(x) = \sqrt{x-t\sqrt{x-t}} \Rightarrow t = \sqrt{x-t} \Rightarrow x \geq 4 \Rightarrow t \geq 2$$

$$f = t+2, \quad g = t-2$$

$$f+g=2t=2\sqrt{x-t} \Rightarrow a=0 \quad / \quad b=2 \quad / \quad c=-t$$

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

$$f(x) = \frac{x+2}{x^2-tx+2} \quad \left. \begin{array}{l} \Rightarrow x=0 = \frac{2}{2} = 1 \\ x=2 = \frac{1}{-1} = -1 \end{array} \right\}$$

$$g(x) = \left\{ (1,1), (1,0), \left(\frac{2}{3}, \frac{1}{3}\right), (0,2) \right\}$$

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

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

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

$$a: f(2x): \left\{ \left(-\frac{1}{2}, 4\right), \left(\frac{1}{2}, 2\right), \left(\frac{2}{3}, -1\right), (4,2) \right\}$$

$$b: f(x^2): \left\{ (-2,2), (-1,1), (1,2), (2,2) \right\}$$

$$c: 2g(x)+1: \left\{ (2,7), (1,-1), (2,3), (-1,1) \right\}$$

$$d: \frac{f-g}{g}: \left\{ (1,-1), (2,-2) \right\}$$

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

$$g(x) = \left\{ (0,1), (2,2), (-2,4), (1,2), (2,3) \right\}$$

$$\Rightarrow \begin{cases} x=1 \Rightarrow h(1) = 2(1) + 1 = 3 \\ x=2 \Rightarrow h(2) = 2(2) + 1 = 5 \\ x=-2 \Rightarrow h(-2) = 2(0) + 4 = 4 \end{cases}$$

$$h = 2f + g \Rightarrow h = \left\{ (2,3), (4,5), (-2,4) \right\}$$

$$g(x) = [x] + [-x] \rightarrow \begin{cases} x = \text{صحیح} \Rightarrow g(x) = 0 \\ x = \text{کسری} \Rightarrow g(x) = -1 \end{cases}$$

$$f(x) = \frac{\sqrt{4x-x}}{x-2} \rightsquigarrow \sqrt{4x-x} \geq 0 \rightarrow 0 \leq x \leq 4 \rightarrow 0, 1, 2, 3$$

خ → صحیح است

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

$$f(x) = \sqrt{ax - x^2 - c}$$

$$\Rightarrow ax - x^2 - c \geq 0 \Rightarrow x^2 + c \leq ax \Rightarrow (x-1)(x-c) \leq 0$$

$$\frac{1}{1-c} +$$

$$1 \leq x \leq c$$

$$g(x) = [(1,0), (0,1), (c,0), (c,1)]$$

$$x = 1, 2, c$$

$$h(x) = \frac{f(x)}{g(x)} = [(1,0), (0, \frac{\sqrt{c}}{1}), (c,0)]$$

نت:

$$y = x^3 - 3x^2 + 3x \rightarrow \text{برای تمام } x \text{ در } \mathbb{R} \text{ داریم}$$

$$R_y = \mathbb{R}$$

ب:

$$y = \frac{1}{x^2 - 2x} \rightarrow (x-1)^2 - 1 \rightarrow \text{مخرج: } (x-1)^2 - 1$$

$$R_y = (-\infty, -1] \cup (0, +\infty)$$

نت:

$$y = x^2 - 4x + 10$$

$$x_s = \frac{-b}{2a} = \frac{4}{2} = 2$$

$$y_s = 6 \rightarrow$$

$$R_y = [6, +\infty)$$

ب:

$$y = -x^2 + 4x + 3$$

$$x_s = \frac{-b}{2a} = \frac{-4}{-2} = 2$$

$$y_s = 7 \rightarrow$$

$$R_y = (-\infty, 7]$$

ب:

$$y = \sqrt{x^2 - 4x + 3}$$

$$x_s = \frac{-b}{2a} = \frac{4}{2} = 2$$

$$y_s = 1 \rightarrow$$

$$R_y = [1, +\infty)$$

ب:

$$y = \sqrt{4x - x^2}$$

$$x_s = \frac{-b}{2a} = \frac{4}{2} = 2$$

$$y_s = 2 \rightarrow$$

$$R_y = [0, 2]$$

نت:

$$y = x^2 - 2x^2 + 2x + 1$$

تابعی از مرتبه فرد

$$R_y = \mathbb{R}$$

$$y = x^3 - 4x^2 + 3x + 2$$

تابعی از مرتبه فرد

$$R_y = \mathbb{R}$$

$$y = \sqrt{x^2 - 4x^2 + 6x + 1}$$

عبارت زیر رادیکال مرتبه فرد دارد
پس هر مقدار مثبتی را می‌شود

$$R_y = [0, +\infty)$$

$$y = (x^2 - 4x^2 + 3x + 1)^2$$

مربع هر عددی
ناقص است

$$R_y = [0, +\infty)$$

نت:

$$y = \frac{2x+1}{x-2}$$

$$\rightarrow y = \frac{ax+b}{cx+d}$$

$$\rightarrow \mathbb{R} = \mathbb{R} - \left\{\frac{a}{c}\right\}$$

$$R_f = \mathbb{R} - \left\{\frac{1}{2}\right\}$$

ب:

$$y = \frac{2x+1}{x+1}$$

$$\rightarrow y = \frac{ax+b}{cx+d}$$

$$\rightarrow \mathbb{R} = \mathbb{R} - \frac{a}{c}$$

$$R_f = \mathbb{R} - \left\{\frac{1}{2}\right\}$$