

$$f(x) = \sqrt{x+4} \sqrt{x-4} \xrightarrow{\text{ربع کامل}} \sqrt{(x-4)+4} \sqrt{x-4} = \sqrt{x-4+4} \sqrt{x-4} \rightarrow \sqrt{x-4+4} \sqrt{x-4}$$

$$g(x) = \sqrt{x-4} \sqrt{x-4} \rightarrow (x-4) - 4\sqrt{x-4} + 4 \rightarrow \sqrt{x-4-4} \sqrt{x-4} \rightarrow \sqrt{x-4-4} \sqrt{x-4}$$

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

$$\frac{a+b}{c} = \frac{2}{-4} = \left[-\frac{1}{2}\right]$$

$$b=2 \quad c=-4$$

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$$f(x) = \frac{x+2}{x^2-4x+3} \rightarrow (2, -1) (1, \infty) (3, \infty) (0, \frac{2}{3})$$

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

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

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$$f(x) = (1, 4) (3, 2) (4, 4) (-1, 12)$$

$$f(x) = (1, 2) (3, -1) (4, 2) (-1, 4)$$

$$g(x) = (-2, 3) (1, -1) (3, 2) (-1, 0)$$

$$f(x) = (1, 2) (3, -1) (4, 2) (-1, 4)$$

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$$f(x) = (2, 1) (3, 1) (4, 9) (-2, 0)$$

$$g = (5, 1) (2, 3) (-2, 4) (-1, 2) (3, 3)$$

$$h = f + g = (2, 5) (3, 5) (-2, 4)$$

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$$f(x) = \sqrt{3x-x} \rightarrow \sqrt{3x-x} \geq 0 \quad \sqrt{3x-x} \geq x \quad 3x-x^2 \geq 0$$

$$x(3-x) \geq 0 \quad x \in [0, 3]$$

$$g(x) = [x] + [-x] \rightarrow \begin{cases} 0 & x \in \mathbb{Z} \\ -1 & x \notin \mathbb{Z} \end{cases}$$

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

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تفاوت نشده

$$f(n) = \sqrt{\frac{5n^2 - n^2 - 4}{0 - 1 - 1}} \quad (1, 0) (2, \sqrt{2}) (4, 0) (5, \sqrt{2})$$

$$g(n) = (1, 2) (2, 2) (3, 2) (5, 1)$$

$$\frac{f(n)}{g(n)} = (1, 0) (2, \frac{\sqrt{2}}{2}) (4, 0)$$

$$g(n)$$

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$$الف) y = x^3 - 3x^2 + 3x$$

برداشت املی:

$$(x-1)^3 - 1 = y \rightarrow x-1 = \sqrt[3]{y+1}$$

$$(x-1)^3 = y+1 \rightarrow x = \sqrt[3]{y+1} + 1$$

$$\rightarrow R = \mathbb{R}$$

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

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$$ب) y = \frac{1}{x^2 - 2x} \quad x^2 y - 2xy = 1 \quad 4y^2 - 4(-y) > 0 \quad 4y(y+1) > 0$$

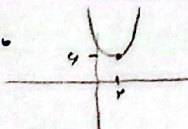
$$x^2(y - 2xy) = 0 \quad \Delta > 0 \quad 4y^2 + 4y > 0 \quad y = 0 \quad y = -1$$

$$\begin{array}{c} -1 \quad 0 \\ + \quad - \quad + \end{array}$$

$$الف) y = x^2 - 4x + 10$$

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

$$\frac{4 - 16 + 10}{-2} = -1 \rightarrow R = [4, +\infty)$$



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

$$\frac{4}{x} = 2 = x \quad y = \sqrt{x^2 - 4x - 3} = -1$$

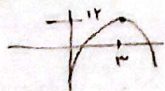
$$\sqrt{[-1, +\infty)} \rightarrow [0, +\infty) = R$$

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$$ب) y = -x^2 + 4x + 3$$

$$\frac{-4}{-2} = 2$$

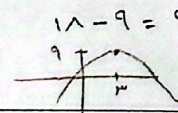
$$-4 + 16 + 3 = 15 \rightarrow R = (-\infty, 15]$$



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

$$\frac{-4}{-2} = 2 \quad 16 - 4 = 12$$

$$\sqrt{[-\infty, 4]} \rightarrow [0, 4] = R$$



$$الف) R$$

ب):

$$ب) R$$

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$$2) \sqrt{R} = [0, +\infty) = \mathbb{R}$$

$$3) y = \frac{(x^2 - 4x^2 + 3x + 1)^2}{R^2} = [0, +\infty) = \mathbb{R}$$

$$الف) \frac{ax+b}{cx-d} = y$$

$$x = \frac{ay+1}{y-3} \rightarrow y \neq 3 \rightarrow R - \{3\}$$

ب):

$$(I) \quad xy - 3y = 3x + 1$$

$$xy = 3x(y-3) + 1$$

$$(II) \quad \frac{1}{y} \rightarrow R = \mathbb{R} - \left\{\frac{a}{c}\right\} \rightarrow \mathbb{R} - \left\{\frac{3}{1}\right\}$$

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$$ب) y = \frac{3x+1}{x+1}$$

$$R - \{3\} \quad \frac{1}{y} \rightarrow xy + y = 3x + 1$$

$$x(3-y) + 1 = y \quad x = \frac{y-1}{3-y} \rightarrow R - \{3\}$$