

۱۹۱۷۵ آفرین ضیاء نیلوفر

$$f(x) \rightarrow \sqrt{x+4}\sqrt{x-4} \rightarrow \sqrt{(\sqrt{x-4}+2)^2} \xrightarrow{x \geq 4} \sqrt{x-4}+2$$

$$g(x) \rightarrow \sqrt{x-4}\sqrt{x-4} \rightarrow \sqrt{(\sqrt{x-4}-2)^2} \xrightarrow{x \geq 4} \sqrt{x-4}-2$$

$$f(x) + g(x) = a + b\sqrt{x+c} \rightarrow 2\sqrt{x-4} \rightarrow \begin{matrix} c = -4 \\ b = 2 \\ a = 0 \end{matrix} \rightarrow \frac{a+b}{c} = \frac{2}{-4} = -\frac{1}{2}$$

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

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

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

۲

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

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

$$ج) 2g^2(x)+1 \rightarrow \{(-2, 19), (1, 3), (3, 1), (-1, 1)\}$$

$$د) \frac{2f}{g} \rightarrow \{(1, -4), (-1, x), (3, -1)\}$$

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$$h = 2f + g \rightarrow \{(2, 4), (3, 4), (-2, 4)\}$$

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$$۱) f(x) = \frac{\sqrt{3x-x}}{x-2}$$

$$D_f \rightarrow [1, 3] - \{2\}$$

$$۱) 3x \geq 0 \rightarrow x \geq 0$$

$$۲) \sqrt{3x-x} \geq x \rightarrow 3x \geq x^2 \rightarrow x(x-3) \leq 0 \rightarrow \frac{0}{x-3} \rightarrow x \in [0, 3]$$

$$۳) x \neq 2$$

$$۳) D\left[\frac{f}{g}\right](x) \rightarrow x \in \{0, 1, 3\}$$

۵

$$۲) g(x) = [x] \cdot [-x] \rightarrow g(x) \neq 1 \rightarrow [x] + [-x] \neq 0 \rightarrow x \in \mathbb{Z}$$

$$D_g \rightarrow \mathbb{R}$$

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

$$f(x) \rightarrow \{(1, 0), (2, \sqrt{2}), (4, 0), (a, x)\}$$

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

$$y = x^3 - 3x^2 + 3x - 1 + 1$$

$$y = (x-1)^3 + 1 \rightarrow y-1 = (x-1)^3$$

$$y = \frac{1}{(x-1)^3 - 1} \rightarrow y((x-1)^3 - 1) = 1$$

$$x = \sqrt[3]{y-1} + 1 \rightarrow \boxed{Ry = \mathbb{R}}$$

خواست بانه $y \neq 0$ است چون در مخرج باشد $y \neq 0$

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

$$Ry = [-\infty, -1] \cup [0, \infty]$$

1, \sqrt{2}

الف) $y = x^2 - 4x + 10$

$$\begin{matrix} x \in \mathbb{R} \rightarrow 2 \\ y \in \mathbb{R} \rightarrow 4 \end{matrix}$$

$$R \rightarrow [4, +\infty]$$

ب) $y = -x^2 + 4x + 3$

$$\begin{matrix} x \in \mathbb{R} \rightarrow 3 \\ y \in \mathbb{R} \rightarrow 13 \end{matrix}$$

$$R \rightarrow [-\infty, 13]$$

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

$$\begin{matrix} x \in \mathbb{R} \rightarrow 2 \\ y \in \mathbb{R} \rightarrow x \rightarrow -3 \end{matrix}$$

$$R = [0, +\infty]$$

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

$$\begin{matrix} x \in \mathbb{R} \rightarrow 3 \\ y \in \mathbb{R} \rightarrow 3 \end{matrix}$$

$$R \rightarrow [-3, 3]$$

الف) $R \in \mathbb{R}$

ب) $R \in \mathbb{R}$

2) $R \in [0, +\infty]$

3) $R \in [0, +\infty]$

الف) $y = \frac{3x+1}{x-2}$

$$Ry = \mathbb{R} - \{3\}$$

ب) $y = \frac{2x-1}{x+1}$

$$Ry = \mathbb{R} - \{2\}$$

الف) $y = n^3 - 3n^2 + 2n - 1 + 1 = y = (n-1)^3 + 1$ (v)

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

$R_f = \mathbb{R}$

ب) $y = \frac{1}{n^2 - 2n} \rightarrow n^2 y - 2ny = 1 \rightarrow n^2 y - 2ny - 1 = 0$

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

$y = 0 \rightarrow 0 = 1 \times$ صفتی وجود ندارد! $\rightarrow R_f = (-\infty, -1] \cup (0, +\infty)$