

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

+ 0/222



$$g(x) = \sqrt{x-f} \sqrt{x+f} = \sqrt{x^2 - f^2} < \sqrt{(x+f)^2} = |x+f| < x+f - f$$

+ 0/222

$$f(x) + g(x) < 2\sqrt{x-f} - 2 + 2 \quad \begin{matrix} a < 1 \\ b < 2 \\ c < -f \end{matrix} \quad \frac{a+b}{c} < \frac{2}{-f} < \boxed{-\frac{1}{f}} \quad \textcircled{D}$$

$$\frac{f}{f} = \left\{ \left(2, -\frac{1}{f} \right) \right\} \quad \textcircled{D} \quad \frac{f}{f-x+f} = -f \quad \frac{4f}{1-f+f} = 0$$

$$\boxed{\left\{ \left(2, -\frac{1}{f} \right) \right\}} \quad \textcircled{D} \quad \frac{f+f}{f-1+f} = 0 \quad \frac{0+f}{0-f+f} = \frac{f}{f}$$

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

$$\begin{matrix} x \geq 1 & x \geq \frac{1}{f} & x \geq \frac{f}{f} & x \geq -\frac{1}{f} \\ x < \frac{1}{f} & x < \frac{f}{f} & x < 2 & x < -\frac{1}{f} \end{matrix}$$

$$\rightarrow \left\{ \left(1, 2 \right) \left(-1, 2 \right) \left(\sqrt{f}, -1 \right) \left(-\sqrt{f}, -1 \right) \left(f, f \right) \left(-f, f \right) \right\} \quad \textcircled{D}$$

$$\begin{matrix} x \geq 1 & x \geq \frac{f}{f} & x \geq f & x \geq -1 \\ x < 1 & x < \frac{f}{f} & x < 2 & x < -\frac{1}{f} \end{matrix}$$

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

$$d = \left\{ \left(1, \frac{f}{f} \right) \left(\frac{f}{f}, -1 \right) \left(-1, \frac{f}{f} \right) \right\}$$

$$h = \left\{ \left(f, 1 \right) \left(-f, 1 \right) \left(f, -1 \right) \right\}$$

$$\sqrt{x^2 - x} \geq 0 \quad \begin{matrix} x \geq 0 \\ x \geq 0 \end{matrix}$$

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

$$\sqrt{x^2} \geq x$$

$$x \geq x^2$$

$$x^2 - x \leq 0$$

$$x(x-1) \leq 0$$

$$\boxed{0 \leq x \leq 1} \quad \boxed{x \neq 1}$$

$$[x] + [-x] + 1 \neq 0$$

$$[x] + [-x] \neq -1 \rightarrow x \in \mathbb{Z}$$

$$\frac{f}{g+1} = \left\{ 0, 1, 3 \right\} \quad \textcircled{D}$$

$$\text{مثال } x^3 - 3x^2 + 2x \rightarrow x-1 < x^3 - 3x^2 + 2x - 1$$

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$$x-1 < (x-1)^3 \quad x-1 < \sqrt[3]{x-1} \quad x < \sqrt[3]{x-1} + 1 \quad R_f \subset \mathbb{R}$$

1, 1.5

$$\rightarrow 1) \quad x^3 - 3xy + 1$$

$$\Delta \geq 0$$

بافرض $y \neq 0$: عبارت را درجه 2 افرض $\frac{x}{y}$

$$x^2 y - 3xy^2 - 1 = 0$$

$$b^2 - 4ac \geq 0$$

$$f_1^2 + f_2^2 \geq 0$$

$$f_1(f_1+1) \geq 0$$

$$\frac{-1}{+4} \quad \frac{0}{-4}$$

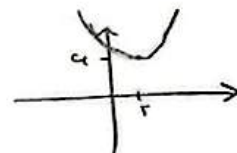
$$R_f \subset (-\infty, -1] \cup [0, +\infty)$$

$$\hookrightarrow x(-3)$$

$$y=0 \rightarrow 0-0-1=0 \quad x$$

$$\text{مثال } \frac{-b}{10} < \frac{f}{y} \leq 2 \quad f = 1 + 10 \leq 9$$

$$R_f \subset [9, +\infty)$$



$$\rightarrow 1) \quad \frac{-9}{-2} \leq 3$$

$$-9 + 18 + 9 \leq 18$$

$$R_f \subset (-6, 18]$$



$$\text{مثال } \frac{f}{y} \leq 2 \quad f = 1 + 3 \leq 4 \quad [-4, +\infty) \cap [0, +\infty)$$

✓

$$\rightarrow 2) \quad -x^2 + 4x \rightarrow \frac{-4}{-2} \leq 2 \quad -4 + 18 \leq 9 \quad (-\infty, 9] \cap [0, 4]$$

$$\text{مثال } R_f \subset \mathbb{R}$$

$$\rightarrow 1) \quad R_f \subset \mathbb{R}$$

$$\text{مثال } R_f \subset [0, +\infty)$$

$$\rightarrow 2) \quad R_f \subset [0, +\infty)$$

✓ -9

$$\text{مثال } R_f \subset \mathbb{R} - \{3\}$$

$$\rightarrow 1) \quad R_f \subset \mathbb{R} - \{3\}$$

✓

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$$f(x) = \sqrt{ax - x^2 + f} \quad \sqrt{-(x-f)(x-1)} \rightarrow -(x-f)(x-1) \geq 0 \quad \frac{1}{-4} \leq \frac{f}{4} \quad [1, f] \subset R_f$$

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$$h(x) = \frac{f(x)}{g(x)}$$

$$g(x) \neq 0 \quad \checkmark \rightarrow D_g \subset \{1, 2, 4, 5\}$$

$$D_h \subset \{1, 2, 4, 5\}$$

✓

$$h(x) \subset \{(1, 0), (2, \frac{\sqrt{3}}{4}), (4, 0)\}$$

$$10 - 4 - 4 = 2$$

$$10 - 14 - 4 = -8$$

$$\text{الف) } y = n^3 - 3n^2 + 2n - 1 + 1 = y = (n-1)^3 + 1 \quad (v)$$

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

$$R_f = \mathbb{R}$$

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

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

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