

سوال ۱)

$$(f(x) + f(y))^2 = (x - \sqrt{x-1}) + (y - \sqrt{y-1}) + 2(x - \sqrt{x-1})(y - \sqrt{y-1})$$

$$2x + 2(y-1) = 2x + 2y - 2$$

$$2x - 1 = (x-1)^2$$

۱۹، ۷۵

آزاد به

$$f+g = \sqrt{x-1}$$

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$\downarrow$ $\downarrow$
 $a+b$ c

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

سوال ۲) $\frac{g}{f} = \left\{ \left(2, -\frac{1}{2} \right), \left(0, \frac{2}{3} \right) \right\}$

$g(2) = 1$
 $f(2) = -2$
 $g(0) = 2$
 $f(0) = 0$

سوال ۳)

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

ب) $f(x) = \left\{ (1, 2), (-1, 2), (\sqrt{3}, -1), (-\sqrt{3}, -1), (2, 2), (-2, 2) \right\}$

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

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

سوال ۴) $h = \left\{ (2, 0), (-2, 2), (3, 0) \right\}$

$f(2) = 1$

$g(2) = 2$

سوال ۵)

$$[a] + [-a] \leq -1$$

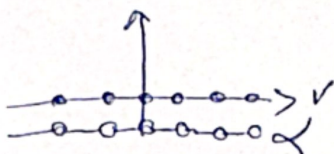
$$D_f \subseteq \mathbb{Z}(\mathbb{I})$$

$$x-2 \neq 0$$

$$x \neq 2$$

$$x \geq 0$$

$$x \geq 0$$



محور

$$[a] = [-4]$$

$$(I) \cap (II) = \{1, 2, 3\}$$

$$\sqrt{3x} - a > 0$$

$$3x > a^2$$

$$a^2 - 3x < 0$$

$$a(a-3) < 0$$

$$\frac{0}{1} \quad \frac{3}{1}$$

$$\left[\frac{0}{1}, \frac{3}{1} \right] = [0, 3]$$

(II)

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

$$f(x) \sqrt{-(x-2)(x-1)}$$

$$(1, \sqrt{2}) \quad (4)$$

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

$$\frac{1}{-1} \frac{2}{3} = -\frac{2}{3}$$

$$[1, 2]$$

$$\frac{f(x)}{g(x)} = \frac{\sqrt{1-x-2}}{\sqrt{2}} = \sqrt{\frac{1-x-2}{2}}$$

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

$$(x-1)^3 + 1$$

$$(x-1)^3 + y - 1 = 0$$

$$x-1 = \sqrt[3]{y-1}$$

$$x = \sqrt[3]{y-1} + 1$$

$$R_f = \mathbb{R}$$

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

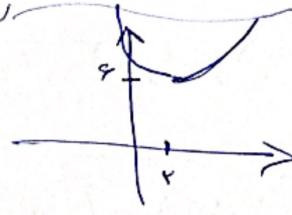
$$4x^3 - 3xy - 1 = 0 \quad \Delta \geq 0 \quad \varepsilon y^2 + 2y \geq 0$$

$$f(y^2 + y) = 0$$

$$\frac{-1}{2} \frac{1}{-1} = \frac{1}{2}$$

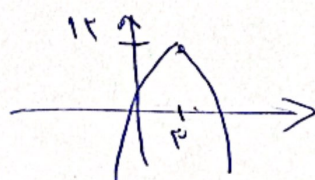
$$R_f = (-\infty, -1] \cup (0, +\infty)$$

$$1) y = \min \left| \frac{-b}{2a} = 2 \right|$$



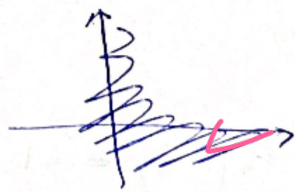
$$R_f = [2, +\infty)$$

$$c) \max \left| \begin{matrix} 4 \\ 12 \end{matrix} \right|$$



$$R_f = (-\infty, 4]$$

$$2) \min \left| \frac{-b}{2a} = 2 \right|$$



$$\sqrt{[-1, +\infty)} = [0, +\infty) \Rightarrow R_f$$

3)

$$\max \left| \begin{matrix} 4 \\ 9 \end{matrix} \right|$$



$$R_f \sqrt{(-\infty, 9]} = [0, 3]$$

الف) $y = n^2 \cdot 2n + 1$

$R_f = \mathbb{R}$

ب) $y = n^2 \cdot 2n + 1$

$R_f = \mathbb{R}$

ج) $\sqrt{n^2 - 2n + 1}$ $\Rightarrow R_f = [-1, +\infty)$

ب) چون n را می توانیم بزرگتر یا کوچکتر از a بگیریم

د) $y = (n^2 - 2n + 1)^2 \Rightarrow \sqrt{y} = n^2 - 2n + 1$

$y \geq 0$

$R_f = [0, +\infty)$

الف) $y = \frac{n^3 + 1}{n - 2}$ $R_f = \mathbb{R} - \{2\}$

ب) $y = \frac{2n + 1}{n + 1}$ $R_f = \mathbb{R} - \{2\}$

$D_f \rightarrow \Delta n - n^2 - 2 \geq 0 \rightarrow n^2 - \Delta n + 2 \leq 0 \rightarrow 1 \leq n \leq 2$

$D_f \cap D_g = \{1, 2, 3\}$

$\frac{f}{g} = h = \{(1, 0), (2, \sqrt{\frac{2}{3}}), (3, 0)\}$