

1 (سوال)

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

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

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

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

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

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

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

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

$g(0) = x$
 $f(0) = 0$

3 (سوال)

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

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

ج) $fg(x) + 1 = \left\{ (-2, 1), (1, 3), (3, 9), (-1, 1) \right\}$

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

4 (سوال) $h = \left\{ (2, 0), (-2, 4), (3, 0) \right\}$

$f(2) = 1$

$f(2) = 2$

5 (سوال)

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

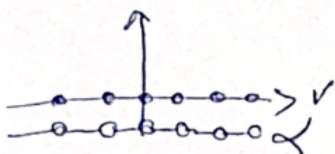
$$D_f \subseteq \mathbb{Z}(\mathbb{I})$$

$$x - 2 \neq 0$$

$$x \neq 2$$

$$x \geq 0$$

$$y \geq 0$$



مختار

$$[a] + [-a]$$

$$(I) \cap (II) = \{1, 0, 3\}$$

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

$$3x \geq a^2$$

$$x \geq \frac{a^2}{3}$$

$$x(a-3) \leq 0$$

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

$$\left[\frac{0}{1}, \frac{1}{-1} \right] = -1 \quad (II)$$

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

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

(4)

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

$$\frac{1}{x} \quad \frac{1}{2}$$

$$[1, 2]$$

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

(V)

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

$$(x-1)^3, y-1 \Rightarrow$$

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

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

$$R_f = \mathbb{R}$$

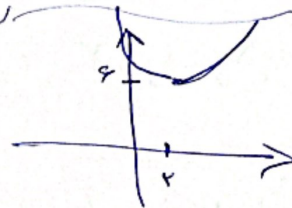
$$b) y = \frac{1}{x^3 - 3x}$$

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

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

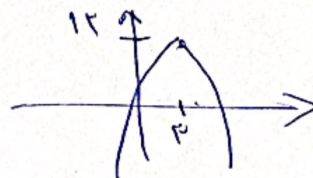
$$\frac{-1}{2} \quad \frac{1}{2} \quad R_f = (-\infty, -1] \cup (0, +\infty)$$

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



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

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



$$R_f = (-\infty, 12]$$

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



$$\sqrt{[-4, +\infty)} = [0, +\infty) \Rightarrow R_f$$

d)

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

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

الف) $y = m^2 \circ 2n + 1$
 (بزرگترین)
 $R_f = \mathbb{R}$

ب) $y = m^2 \circ 2n + 1$ $R_f = \mathbb{R}$
 (بزرگترین)

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

بزرگترین و کوچکترین
 2 بار

د) $y = (m^2 - 2n^2 + 1)^2 \Rightarrow \sqrt{y} = m^2 - 2n^2 + 1$
 $y \geq 0$ $R_f = [0, +\infty)$

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

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