

سوال

در صفحه ۱

$$D_f = R - \{1, 3\} \rightsquigarrow f(x) = \frac{x}{x-1} = -x$$

(۲)

$$f(0) = \frac{0}{0-1} = 0$$

$$\frac{g}{f} = \left\{ -\frac{1}{x}, 4 \right\}$$

$$\left\{ (0, 4), (1, -\frac{1}{x}) \right\}$$

$$\{1, 3\}$$

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

(۳)

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

$$xg'(x) + 1 = \left\{ (-x, 4), (1, 3), (x, 4), (-1, 1) \right\}$$

$$\frac{xg}{g} = \left\{ (1, -4), (x, -1), (-1, 4) \right\} \Rightarrow \left\{ (1, -4), (x, -1) \right\}$$

$$xg + g = \left\{ (x, 4), (3, 4), (-x, 4) \right\}$$

(۴)

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

(۵)

$$\sqrt{1-x} - x$$

$$x-1$$

$$\frac{[x] + [-x] + 1}{1}$$

$$\sqrt{1-x} - x$$

$$\frac{(\underbrace{x-1})_1 (\underbrace{[x] + [-x] + 1})_1}{1}$$

$$x \geq 0 \rightarrow [x] \geq 0$$

$$x < 0 \rightarrow [x] \leq -1$$

$$\sqrt{1-x} - x \geq 0 \rightarrow \sqrt{1-x} \geq x \rightarrow x \geq 0$$

$$Df = -x^2 + 5x - 4 \geq 0 \rightsquigarrow x^2 - 5x + 4 \leq 0 \rightsquigarrow (x-1)(x-4) \leq 0 \quad (6)$$

$$\frac{-1}{+1} \frac{4}{-1} \quad [1, 4] \quad f(1) = -1 + 5 - 4 = 0$$

$$f(4) = -4 + 20 - 4 = 12$$

$$f(4) = -16 + 20 - 4 = 0$$

$$\frac{f(x)}{g(x)} = \left\{ (1, 0), \left(2, \frac{\sqrt{3}}{2} \right), (4, 0) \right\}$$

(الف) $(x-1)^2 + 1$ $R_f = R$ $R = \mathbb{R}$ (7)

(ب) $yx^2 - 2yx - 1 = 0 \rightarrow x = \frac{2y \pm \sqrt{4y^2 + 4y}}{2y} \rightarrow \Delta \geq 0$

$$4y^2 + 4y \geq 0 \rightarrow 4y(y+1) \geq 0 \quad \frac{-1}{+1} \frac{0}{-1} \quad (-\infty, -1] \cup (0, +\infty) = R_f$$

(الف) $-\frac{b}{2a} = \frac{+4}{2} = 2 \rightsquigarrow 4 - 1 + 1 = 4 \quad R_f = [4, +\infty)$ (8)

(ب) $-\frac{4}{-2} = 2 \rightsquigarrow -9 + 11 + 3 = 12 \quad R_f = (-\infty, 12]$

(ج) $-\frac{b}{2a} = \frac{+4}{2} = 2 \rightsquigarrow 4 - 1 - 3 = -1 \rightsquigarrow R_f = [0, +\infty)$

(د) $-\frac{b}{2a} = \frac{-4}{-2} = 2 \rightsquigarrow 11 - 9 = 2 \rightsquigarrow R_f = [0, 2]$

(الف) $R_f = \mathbb{R}$ (ب) $R_f = \mathbb{R}$ (ج) $R_f = [0, +\infty)$ (9)

(د) $R_f = [0, +\infty)$

(الف) $R_f = \mathbb{R} - \{3\}$ (ب) $R_f = \mathbb{R} - \{1\}$ (10)

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

$$= \sqrt{x-r} + r$$

$$g(x) = \sqrt{(\sqrt{x+r})^2 + r + r\sqrt{x+r}} = \sqrt{(\sqrt{x+r} + r)^2} =$$

$$\sqrt{x+r} + r$$

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

$$a=0, b=r, c=-r$$

$$\frac{a+b}{c} = \frac{0+r}{-r} = \left(-\frac{1}{r} \right)$$

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