

۱- $f(x) \geq 0 \rightarrow x = -5, 2, 5$ $f(x) = 0 \rightarrow x = 0$

در بازه‌های $[-5, 0]$ و $[2, 5]$

جواب: بازه‌های مساوی می‌شود.

$Df = [-5, 0] \cup [2, 5]$

۲- $f(x) \geq 0 \rightarrow x = -3, 2, 5$ $f(x) = 0 \rightarrow x = 0$

$Df = (-3, 0)$ و $(2, 5)$

$Df = (-3, 2) \cup (2, 5)$

۳- ابتدا $f(2)$ را بدست می‌آوریم.

$f(2) - 2f(2) = 4 - 3(2) + 4 - 2$

$-f(2) = 2 \Rightarrow f(2) = -2$

$f(-2) \Rightarrow f(-2) \cdot 2(-2) = (-2)^2 - 3(-2) + 4 \rightarrow f(-2) = 14 - 4 = 10$

۴- $f(5) \rightarrow 5 - \sqrt{9} \Rightarrow 5 - 3 = 2 \rightarrow f(f(5)) = f(2) \Rightarrow (2 \times 2) + 3 = 7$

$f(1) \rightarrow (2 \times 1) + 3 = 5 \rightarrow f(f(1)) = f(5) \Rightarrow 5 - \sqrt{9} = 2$

$f(f(5)) + f(f(1)) \Rightarrow 7 + 2 = 9$

$f(x-1) \Rightarrow a(x-1)^2 - b(x-1) + 1 \Rightarrow ax^2 + a - 2ax - bx + 1 + 1 - a$

$\overbrace{ax^2 + 1 - 2x}^{x^2 + 1 - 2x} - \overbrace{bx + 1}^{-bx + 1}$

$f(x) \Rightarrow ax^2 - bx + 1$

$$-2ax + a + b$$

$$f(x-1) - f(x) = \sqrt{x^2 + a - 2ax - b} - \sqrt{x^2 + a - 2ax - b + 1} = 9x + 1$$

$$a - 2ax + b = 9x + 1 \Rightarrow -2a = 9 \rightarrow a = -\frac{9}{2}$$

$$a + b = 1 \Rightarrow -\frac{9}{2} + b = 1 \rightarrow b = \frac{11}{2} \quad a - b = -\frac{9}{2} - \frac{11}{2} = -10$$

$$\frac{x^2 + f(x+1)}{x^2 + f(x+1)} = \frac{(x+1)^2 + 1}{(x+1)^2 + 1} \Rightarrow f(\sqrt{3}-1) = \frac{(\sqrt{3}-1)^2 + 1}{(\sqrt{3}-1)^2 + 1} = \frac{1}{1} = 1 \quad -9$$

$$\frac{x^2 + 1}{x^2} = \frac{x^2 + 1}{x^2} = \frac{x^2 + 1}{x^2} \Rightarrow f(x - \frac{1}{x}) = \frac{x^2 + 1}{x^2} \quad -1$$

$$f(x - \frac{1}{x}) = (x - \frac{1}{x})^2 + 1 \Rightarrow f(-3) = (-3)^2 + 1 = 10$$

$$\text{الف) } f \Rightarrow 9 - x^2 \geq 0 \rightarrow 9 \geq x^2 \rightarrow -3 \leq x \leq 3. \quad -1$$

$$Df = \{1, 0, 1\} \quad Dg = -3 \leq x \leq 3$$

$$\frac{f}{g} = \left\{ \left(1, \frac{0}{\sqrt{1}}\right), \left(1, -\frac{1}{\sqrt{1}}\right), \left(0, \frac{1}{\sqrt{1}}\right) \right\} \Rightarrow \left\{ (1, 0), (1, -1), (0, 1) \right\}$$

$$\hookrightarrow \frac{1 \times \sqrt{1}}{1 \times \sqrt{1}} = \frac{1}{1} = 1$$

$$\text{ب) } \frac{f}{g} = \left\{ \left(1, \frac{0}{\sqrt{1}}\right), \left(1, \frac{1}{\sqrt{1}}\right), \left(0, \frac{1}{\sqrt{1}}\right) \right\} = \left\{ (1, 0), (1, 1), (0, 1) \right\}$$

$$\hookrightarrow \frac{1 \times \sqrt{1}}{1 \times \sqrt{1}} = \frac{1}{1} = 1$$

$$\text{الف) } \{(1, 1), (1, 1), (-1, 1), (1, -1)\} \quad -1$$

$$\text{ب) } \{(1, 1), (1, 1), (-1, 1), (1, -1)\}$$

زنگنه

$$ج) \{ (2, 4), (3, 49), (-5, 13), (1, 13) \}$$

$$د) \{ (1, 1), (\frac{3}{4}, 4), (-\frac{5}{4}, 2), (\frac{1}{4}, -2) \}$$

$$الف) f - g = \{ (1, 4), (2, 2), (3, 2) \}$$

-10

$$ب) \frac{2f}{g} = \{ (\cancel{1}, \cancel{4}), (2, \frac{9}{1}), (3, \frac{2}{-1}) \} \Rightarrow \{ (2, 9), (3, -2) \}$$