

$$x f(x) \geq 0 \Rightarrow x \text{ و } f(x) \rightarrow \text{هم علامت} \quad | \quad x=0 \quad | \quad f(x)=0 \Rightarrow D_f = [-5, 0] \cup [2, 5] \quad (1)$$

(۲) ✓

$$\frac{-x}{f(x)} \geq 0, f(x) \neq 0 \Rightarrow x \neq -3, 0, 2, 5 \quad | \quad -x \text{ و } f(x) \rightarrow \text{هم علامت} \Rightarrow x \text{ و } f(x) \rightarrow \text{خلاف علامت} \quad (2)$$

(۲) ✓ $D_f = (-3, 0) \cup (0, 2)$ $\rightarrow -2, -1, 1 \rightarrow \boxed{[-3]}$ $\rightarrow$ جواب

$$x=2 \rightarrow f(x) - 2f(x) = f(x) - 2f(x) = -f(x) = x - 4 + x = 2 \rightarrow f(x) = -2 \quad (3)$$

$$f(-2) - 2f(x) = x + 4 + x = 1x \rightarrow f(-2) = 1 \quad (4) \quad (۲) \quad \checkmark$$

$$f(1) = 2x + 3 = 5 \rightarrow f(5) = 5 - \sqrt{\frac{5+x}{3}} = 2 \quad f(x) = x + 3 = 7 \rightarrow 7 + 2 = 9 \quad (5) \quad (۲) \quad \checkmark$$

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

$x^2 + 1 - 2x$ $\rightarrow$ اداءه صفی بعد

(۵)

-1 = جواب ←

$$a) : ax^2 + a - 2ax - bx + b + 1 - ax^2 + bx - 1 = 4x + 1 / a - b = -2 - a = -1 \quad (2) \checkmark$$

$$\Rightarrow a + b - \frac{2ax}{4} = 4x + 1 \rightarrow -2a = 4 \rightarrow \boxed{a = -2}, -2 + b = 1 \rightarrow \boxed{b = 3}$$

$$\frac{f(1) + a}{1} = \boxed{1}$$

$$f(x) = -1 \{ f(3) = 9 - 9 + 1 = 1 \quad (3) \checkmark$$

$$f(-1) = 1 + 2 + 1 = 4$$

$$\frac{f(x)}{f(x)} = 1x + 1 = 1x / f(-1) = 1 / f(x) = 1$$

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

$$\frac{f(f(x)) - f(f(3))}{f(1) - 1} = 0$$

$$f(\sqrt{3}-1) = \frac{(\sqrt{3}-1)^2 + 1(\sqrt{3}-1) + 9}{(\sqrt{3}-1)^2 + 1(\sqrt{3}-1) + 4} = \frac{3+1-2\sqrt{3}+\sqrt{3}-1+9}{3+1-2\sqrt{3}+\sqrt{3}-1+4} = \frac{1}{1} = 1 \quad (4) \checkmark$$

$$f(x) = \frac{x+1+9}{x+1+4} = \frac{11}{5} \leftarrow \text{جواب}$$

$$f(\sqrt{x}) = x + \frac{1}{x} \rightarrow (x + \frac{1}{x})^2 = x^2 + \frac{1}{x^2} + 2 \rightarrow x^2 + \frac{1}{x^2} + 2 - 2x - \frac{1}{x} = 2 \quad (5) \checkmark$$