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$$D_{f(x)} = [-4, 5]$$

$$D_y \rightarrow x \cdot f(x) \geq 0$$

$\swarrow$
 $\downarrow$
 $-4, 2, 5$

$$\begin{array}{ccccccc} -4 & 0 & 2 & 5 \\ - & + & - & + & // \end{array}$$

$$D_y = [-4, 0] \cup [2, 5]$$

Ⓟ ✓

$$D_{f(x)} = [-4, 5]$$

$$D_y \rightarrow \frac{-x}{f(x)} \geq 0$$

$\swarrow$
 $\downarrow$
 $-3, 0, 2, 5$

$$\begin{array}{ccccccc} -3 & 0 & 2 & 5 \\ - & + & - & + & // \end{array}$$

$$D_y = (-3, 0) \cup (0, 2)$$

Ⓟ ✓

اعداد صحیح موجود در دامنه $y \leftarrow 1, -1, -2 \leftarrow 3$

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

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

$$f(-2) = 10$$

Ⓟ ✓

$$f(1) = 5 \rightarrow f(5) = 2$$

$$f(5) = 2 \rightarrow f(2) = 5 \Rightarrow 2+5=7$$

Ⓟ ✓

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

$$f(x-1) - f(x) = 4x + 2 \rightarrow (ax^2 - 2ax + a - bx + b + 2) - (ax^2 - bx + 2) = -2ax + a + b$$

$$-2a = 4 \Rightarrow a = -2 \quad / \quad a + b = 2 \quad / \quad -2 + b = 2 \Rightarrow b = 4$$

$$a - b = -2 - 4 = -6$$

Ⓟ ✓

$f(1) = 9 - 9 + 1 = 1$ $f(-1) = 1 + 1 + 1 = 3 \rightarrow \frac{f(1) + \alpha}{(-1)^1} = 1$ $f(1) = 9 - 9 + 1 = 1$ (2) ✓	6
$f(4) = 3 \times 4 + 1 = 13$ $f(-1) = (-1)^1 = -1 \rightarrow \frac{3(13) - f(4)}{1} = \frac{39 - 1}{1} = 38$ $f(1) = 1$ (2) ✓	7
$f(4) = 1 \rightarrow f(1) = 4$ $f(4) = 4 \rightarrow f(1) = 4 \rightarrow \frac{4 - 4}{4 - 1} = \frac{0}{3} = 0$ $f(1) = 4$ (2) ✓	8
$\frac{(\sqrt{x} - 1)^2 + f(\sqrt{x} - 1) + 9}{(\sqrt{x} - 1)^2 + f(\sqrt{x} - 1) + \alpha} = \frac{\sqrt{x}^2 - 2\sqrt{x} + 1 + f(\sqrt{x} - 1) + 9}{\sqrt{x}^2 - 2\sqrt{x} + 1 + f(\sqrt{x} - 1) + \alpha} = \frac{1}{x} = x$ $f(\sqrt{x} - 1) = \frac{(\sqrt{x} - 1 + 1)^2 + \alpha}{(\sqrt{x} - 1 + 1)^2 + 1} = \frac{x + \alpha}{x + 1} = x$ (1) - (b)	9
$f(\sqrt{x}) = \sqrt{x}^2 + \frac{1}{\sqrt{x}} = x + \frac{1}{x} = \frac{x^2 + 1}{x} = x$ $f(x) = x^2 + \frac{1}{x^2} \rightarrow f(\sqrt{x}) = (\sqrt{x})^2 + \frac{1}{(\sqrt{x})^2} = x + \frac{1}{x}$ $(f(\sqrt{x}))' - f(x) = 2x - x^2 + \frac{1}{x^2} = \frac{1}{x^2}$ $f(\sqrt{x})' - f(x) = (x + \frac{1}{x})' - (x^2 + \frac{1}{x^2})$ $x^2 + \frac{1}{x^2} + 1 - x^2 - \frac{1}{x^2} = 1$	10