

$$\begin{aligned} [-2, -1] &\rightarrow x \text{ ثابت منفی است} \\ [-1, 0] &\rightarrow \text{ثابت مثبت} \\ (0, 2) &\rightarrow x \text{ مثبت} \\ [2, 5] &\rightarrow \text{ثابت مثبت} \end{aligned} \quad \left. \vphantom{\begin{aligned} [-2, -1] &\rightarrow x \text{ ثابت منفی است} \\ [-1, 0] &\rightarrow \text{ثابت مثبت} \\ (0, 2) &\rightarrow x \text{ مثبت} \\ [2, 5] &\rightarrow \text{ثابت مثبت} \end{aligned}} \right\} D_f = [-1, 0] \cup [2, 5] \quad \text{و } f(x) > 0$$

۱

$$\begin{aligned} (-2, 0) &\rightarrow + \sim \frac{-x}{f(x)} > 0 \\ (0, -2) &\rightarrow + \sim \frac{-x}{f(x)} > 0 \end{aligned} \quad \left. \vphantom{\begin{aligned} (-2, 0) &\rightarrow + \sim \frac{-x}{f(x)} > 0 \\ (0, -2) &\rightarrow + \sim \frac{-x}{f(x)} > 0 \end{aligned}} \right\} \begin{aligned} f(x) &\neq 0, \frac{-x}{f(x)} > 0 \\ (x=0, x=-2) &\text{نقطه} \end{aligned}$$

۲

$$D_f = (-2, 0) \cup (0, 2) \rightarrow \text{مجموعه} \rightarrow -2, -1, 1$$

$$\begin{aligned} f(x) - 2f(2) &= x^2 - 2x + 4 \\ x=2 &\rightarrow f(2) - 2f(2) = 4 - 4 + 4 = 4 \\ -f(2) &= +4 \\ \boxed{f(2) = -4} \end{aligned} \quad \begin{aligned} x &= -2 \\ f(-2) - 2f(2) &= 4 + 4 + 4 = 12 \\ f(-2) + 4 &= 16 \\ \boxed{f(-2) = 10} \end{aligned}$$

۳

$$\begin{aligned} f(f(1)) + f(f(1)) &\rightarrow f(2) + f(1) = 1 + 2 = 3 \\ \downarrow &\quad \downarrow \\ 1 - \sqrt{1} &= 2 \quad 1 \end{aligned}$$

۴

$$\begin{aligned} f(x-1) &= a(x-1)^2 - b(x-1) + c = a(x^2 + 1 - 2x) - bx + b + c \\ &= ax^2 + a - 2ax - bx + b + c - f(x) = \\ &= ax^2 + a - 2ax - bx + b + c - (ax^2 + bx - c) = \underline{a + b - 2ax} \end{aligned}$$

۵

$$a + b - 2ax = 4x + 2$$

$$\begin{aligned} 4 &= -2a \rightarrow a = -2 \\ a + b &= 2 \rightarrow b = 4 \end{aligned} \quad \left\{ \begin{aligned} a - b &= -2 - 4 = -6 \\ a - b &= -2 - 4 = -6 \end{aligned} \right. \quad \boxed{-6}$$

$$f(r) = 1$$

$$f(-1) = \omega$$

$$f(r) = -1$$

$$\frac{r f(r) + f(-1)}{f(r)} = \frac{r + \omega}{\cancel{(-1+r)}} = \boxed{V}$$

6

$$\left. \begin{aligned} f(1) &= 13 \\ f(-1) &= 2 \\ f(r) &= V \end{aligned} \right\}$$

$$\frac{r f(1) - r f(-1)}{f(r)} = \frac{r \times 13 - 2}{V} = \frac{r9 - 2}{V} = r1/V$$

7

$$\textcircled{1} \rightarrow f(1) = 1 \rightarrow f(1) = 4$$

$$\textcircled{2} \rightarrow f(r) = 2 \rightarrow f(r) = 4$$

$$\textcircled{3} \rightarrow f(1) = 4$$

$$\frac{\overbrace{f(f(1))}^{\textcircled{1}} - \overbrace{f(f(r))}^{\textcircled{2}}}{\overbrace{f(1)-r}^{\textcircled{3}}}$$

$$\Rightarrow \frac{4 - 4}{2} = 0$$

8

$$f(f(\sqrt{r-1})) = ?$$

$$f(\sqrt{r-1}) = \frac{\overbrace{(-\sqrt{r-1})^r}^{r+\varepsilon-\varepsilon\sqrt{r}} + \overbrace{\varepsilon(\sqrt{r-1})+1}^{\varepsilon\sqrt{r}-1}}{\underbrace{(\sqrt{r-1})^r + \varepsilon(\sqrt{r-1}) + \omega}_{-1}} = \frac{-1+1}{-1+\omega} = \frac{1}{\varepsilon} = r$$

$$f(r) = \frac{\varepsilon + 1 + 1}{\varepsilon + 1 + \omega} = \frac{r1}{11}$$

9

$$(f(\sqrt{a}))^r - f(a) = ?$$

$$\left(\frac{a+1}{a}\right)^r - f(a)$$

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

10