

$$x f(x) \geq 0 \quad D_f = [-5, 0] \cup [2, 5]$$

$\begin{matrix} + & + \\ - & - \end{matrix}$
 $\begin{matrix} \text{منفی ها و صفر} & \text{مثبت ها} \end{matrix}$

$$f(x) \neq 0 \quad \frac{-x}{f(x)} \geq 0$$

$\begin{matrix} -3 & 0 & 2 & 5 \\ - & + & - & + & - \end{matrix} \rightarrow [-3, 0] \cup [2, 5]$

$\rightarrow -3, 0, 2, 5$ (ریشه های نمودار) $\checkmark$ (اعداد صحیح)

$$f(2) - 2f(2) = 4 - 6 + 4 \rightarrow -f(2) = 2 \rightarrow f(2) = -2$$

$$f(-2) - 2f(-2) = 4 + 6 + 4 \rightarrow f(-2) = 10$$

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

$\begin{matrix} \swarrow & \swarrow & \downarrow & \downarrow \\ 5-2=3 & 2 \times 1 + 3 = 5 & 2 \times 2 + 3 = 7 & 5-2=3 \end{matrix}$

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

$$x=1 \rightarrow -a+b=1 \rightarrow a-b=-1$$

$$\left. \begin{aligned} f(3) &= 9 - 9 + 1 = 1 \\ f(-1) &= 1 + 3 + 1 = 5 \\ f(2) &= 4 - 9 + 1 = -1 \end{aligned} \right\}$$

$$\frac{3 \times 1 + 5}{(-1)^2} = \frac{8}{1} = \underline{8}$$

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$$\left. \begin{aligned} f(4) &= 3 \times 4 + 1 = 13 \\ f(-2) &= (-2)^2 = 4 \\ f(2) &= 3 \times 2 + 1 = 7 \end{aligned} \right\}$$

$$\frac{3 \times 13 - 2 \times 4}{1 \times 7} = \frac{31}{7}$$

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$$\frac{f(f(3)) - f(f(2))}{f(3) - 2} = \frac{9 - 4}{1} = \underline{5}$$

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$$\frac{3 + 5 - 5\sqrt{3}}{(\sqrt{3} - 2)^2 + \sqrt{3} - 1 + 9} = \frac{1}{5} = 2 \quad f(2) = \frac{2 + 1 + 9}{2 + 1 + 5} = \underline{\frac{11}{8}}$$

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$$f(\sqrt{x}) = x + \frac{1}{2x}$$

$$\left(x + \frac{1}{2x}\right)^2 - x - \frac{1}{2x^2} = \underline{2}$$

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