

$$x = a \Rightarrow a^2 + 2a = a^2 - \varepsilon \Rightarrow \underline{a = -2}$$

«حزق دو عنصر است»

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$$g(x) = 2x + b \xrightarrow{(r, c)} 3 = \varepsilon + b \rightarrow b = -1$$

$$f(x) = \frac{x^2 + a}{2x - b} \xrightarrow{(r, c)} 3 = \frac{\varepsilon + a}{\varepsilon + 1} \rightarrow 3\varepsilon = \varepsilon + a \rightarrow a = 11$$

$$\Rightarrow f(1) = \frac{1^2 + a}{2 \cdot 1 - b} \xrightarrow{\substack{a=11 \\ b=-1}} f(1) = \frac{12}{3} = \underline{\varepsilon}$$

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$$D_f = \mathbb{R} - \{-1, \varepsilon\} \Rightarrow \text{مخرج‌های ریشه‌ها} = -1, \varepsilon$$

$$\begin{cases} x = -1 : 2 - a + b = 0 \\ x = \varepsilon : 3\varepsilon + \varepsilon a + b = 0 \end{cases} \Rightarrow \begin{cases} 2 - a + b = 0 \\ 3\varepsilon + \varepsilon a + b = 0 \end{cases} \Rightarrow \begin{cases} 3\varepsilon + \varepsilon a = 0 \\ 2 - a + b = 0 \end{cases} \Rightarrow \begin{cases} a = -3 \\ b = -1 \end{cases}$$

$$f(1) = \frac{\varepsilon + 1}{2 + a + b} \xrightarrow{\substack{a=-3 \\ b=-1}} f(1) = \frac{\varepsilon}{-1}$$

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$$D_f = \mathbb{R} - \{-1\} \Rightarrow \text{مخرج دارای ریشه مضامف است}$$

$$-\varepsilon x^2 + ax + b = -\varepsilon(x+1)^2 = -\varepsilon x^2 - 2\varepsilon x - \varepsilon$$

$$\Downarrow a = -2\varepsilon / b = -\varepsilon \Rightarrow a + b = -3\varepsilon$$

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$$D_f = \mathbb{R} - \{1\} \Rightarrow \text{تنها ریشه‌ی مخرج عدد یک است}$$

$$\begin{cases} \Delta = 0, x_1 = x_2 = 1 \Rightarrow x^2 + mx + 1 = (x-1)^2 \Rightarrow m = -2 \quad \textcircled{\text{I}} \\ \Delta < 0 \Rightarrow \text{ریشه‌ها دارد} \Rightarrow m^2 - \varepsilon < 0 \Rightarrow m^2 < \varepsilon \Rightarrow -2 < m < 2 \quad \textcircled{\text{II}} \end{cases}$$

$$\textcircled{\text{I}}, \textcircled{\text{II}} \Rightarrow P_m = \underline{[-2, 2]}$$

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