

$$f(x) = \sqrt{f - \frac{1}{x^2}} \rightarrow f - \frac{1}{x^2} \geq 0 \rightarrow f \geq \frac{1}{x^2} \rightarrow fx^2 \geq 1 \xrightarrow{|x| \geq 1} |2x| \geq 1$$

$$\begin{cases} 2x \leq -1 \rightarrow x \leq -\frac{1}{2} \\ 2x \geq 1 \rightarrow x \geq \frac{1}{2} \end{cases} \cup \quad \text{---} \quad \begin{matrix} \bullet & \bullet \\ -\frac{1}{2} & \frac{1}{2} \end{matrix} \quad (-\infty, \frac{1}{2}] \cup [\frac{1}{2}, +\infty)$$

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$$f(x) = \sqrt{mx^2 + 2mx + 1} \rightarrow \text{زیرادیفال} \geq 0 \rightarrow \text{مضروب} +$$

$$\Delta \leq 0 \rightarrow 4m^2 - 4m \leq 0 \rightarrow 0 \leq m \leq 1 \rightarrow [0, 1]$$

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$$f(x) = \begin{cases} \frac{fx^2 - 1}{2x - 1} & : x \neq \frac{1}{2} \\ fx + k & : x = \frac{1}{2} \end{cases}$$

$$g(x) = 2x + 1$$

$$\begin{aligned} 2x + 1 &= fx + k \quad x = \frac{1}{2} \\ 2 &= f + k \rightarrow k = 0 \end{aligned}$$

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$$\rightarrow a + k = 0 + \frac{1}{2} = \frac{1}{2}$$

$$\begin{cases} -2a + 2 = -2 + b \\ 1 = 2 + b \end{cases}$$

$$\begin{aligned} -2a - b &= -\xi + b \rightarrow 2x^2 + \xi = b \rightarrow b = -2 \\ b &= -2 \\ -2a &= -4 \\ a &= 2 \end{aligned} \quad a - b = 4$$

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$$2a^2 + ax = x + 2 \xrightarrow{x=2} 2a^2 + 2a = 2 \rightarrow 2a^2 + 2a - 2 = 0$$

$$\begin{aligned} a^2 + a - 1 &= 0 \rightarrow (a - 1)(a + 1) \\ &\quad \begin{matrix} 2 \downarrow & -1 \downarrow \end{matrix} \\ &\quad \begin{matrix} a = \frac{1}{2} \\ a = -\frac{1}{2} \end{matrix} \end{aligned}$$

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