

$$x^2 f(x+1) \geq 0$$

$$f(x+1) = 0 = \left(\frac{1}{x}\right)^{x-1} - 1 = 0$$

$$\frac{1}{0} + \frac{1}{0} =$$

$$\left(\frac{1}{x}\right)^{x-1} = 1 \Rightarrow x = 1$$

$$D_f = [0, +1]$$

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$$f(x) \sqrt{x+1-x+2} \Rightarrow -x + |x+2| \geq 0$$

$$-x+2 \leq x \Rightarrow 2 \leq 2x \Rightarrow x \geq 1$$

$$|x+2| \leq x$$

$$\begin{aligned} -x+2 &\geq x \\ -2x+2 &\geq 0 \\ -2x &\geq -2 \\ x &\leq 1 \end{aligned}$$

$$f(-x) \text{ بنابرین } x$$

$$D_f = (-\infty, +1]$$

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$$f(x) \text{ در بازه } [0, 1] \text{ و در بازه } [1, 2] \text{ و در بازه } [2, 3]$$

$$\frac{x-1}{f(x)} \geq 0$$

$$\frac{-1}{0} + \frac{1}{1} + \frac{2}{2} = 1$$

$$D_f = (-\infty, 1] \cup (2, 3) \text{ بنابرین } x$$

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$$\frac{1}{9x^2 - 4x^2 - 4x - 4} = \frac{1}{5x^2 - 4x - 4}$$

$$9x^2 - 4x^2 - 4x - 4 = 0 \Rightarrow 5x^2 - 4x - 4 = 0$$

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$$x^2 + x - \left(\frac{4x}{x^2} + \frac{x}{x}\right) \geq 0$$

$$x^2 + x \geq \left(\frac{4x}{x^2} + \frac{x}{x}\right) \Leftrightarrow \text{if } x \neq 0$$

$$x+1 \geq \left(\frac{4}{x} + 1\right)$$

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$$f(\tilde{q}^{\tilde{r}}) \leq \tilde{q}^{\tilde{r}-1}$$

$$\text{if } d \leq 1 \Rightarrow f(\tilde{r}+1) \leq f(\tilde{r}) \leq 1$$

$$\text{if } d \leq 1 \Rightarrow f(\tilde{r}+1) \leq f(\tilde{r}) \leq 1$$

$$f(\tilde{r}) + f(\tilde{r}+1) \leq 1$$

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