

$$(a-1)x^2 + (a-1)x + 1$$

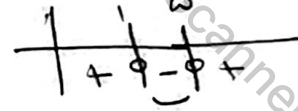
$$a < 0 \Rightarrow a-1 < 0 \rightarrow a < 1$$

$$\Delta = b^2 - 4ac = (a-1)^2 - 4(a-1) = a^2 - 2a + 1 - 4a + 4 = a^2 - 6a + 5$$

$$\Delta < 0 \Rightarrow a^2 - 6a + 5 < 0$$

$$(a-5)(a-1) < 0$$

$$a < 5 \quad a > 1$$



→ \emptyset

$$\frac{m(m^2+m)}{m-2} \geq \frac{m(m(m^2+1))}{m-2}$$

فاندر حقیقی

$$\frac{m^2(m^2+1)}{m-2}$$



$$m \in (2, +\infty)$$

$$\frac{(x^2-x-4)(x-1)^2}{(x^2-x+1)(x-2)^2} > 0$$

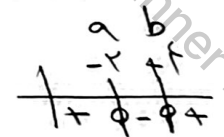
$$\frac{(x^2-x-4)(x-1)^2}{(x^2-x+1)(x-2)^2}$$



$$x \in [-2, 1) \cup [3, +\infty)$$

$$f(x) = \frac{3x^2-2x}{x^2+4} < 2 \rightarrow \frac{3x^2-2x-2x^2-8}{x^2+4} < 0$$

$$\frac{x^2-2x-8}{x^2+4} < 0 \rightarrow \frac{(x-4)(x+2)}{(x^2+4)}$$



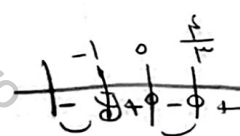
$$b-a = 4 - (-2) = 6$$



$$\left(-1, \frac{4}{3} \right)$$

$$-1 < \frac{3x^2-4x}{x+1} \rightarrow 0 < \frac{3x^2-4x+x+1}{x+1} \rightarrow \frac{3x^2-3x+1}{x+1} > 0$$

$$\frac{3x^2-4x}{x+1} < 0 \rightarrow \frac{x(3x-4)}{x+1} < 0$$



$$(-\infty, -1) \cup (0, \frac{4}{3})$$

FROM :

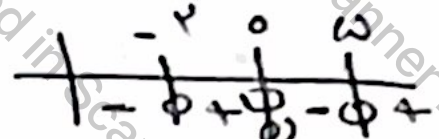
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$$\frac{\lambda^2 - 1}{\lambda} \leq \lambda$$

$$\frac{\lambda^2 - 1 - \lambda^2}{\lambda} \leq 0$$

$$\frac{(\lambda - \omega)(\lambda + \omega)}{\lambda} \leq 0$$



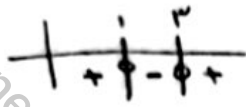
$$\lambda \in (-\infty, -\omega] \cup (0, \omega]$$

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هم رفته

$$x^2 - ax + b$$



$$f(x) \leq x^2 - ax + b < 0$$

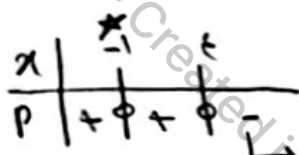
$$f(1) \leq 1 - a + b \leq 0 \rightarrow$$

$$f(2) \leq 4 - 2a + b \leq 0 \rightarrow$$

$$\begin{cases} b - a \leq -1 \\ 2b - 2a \leq -4 \end{cases}$$

$$\begin{aligned} a &\leq 1 \\ b &\leq 2 \end{aligned} \rightarrow a + b \leq 3$$

$$y = ((k-2)x + m-1)(x-2n)^2$$



$$\begin{aligned} x - 2n &\leq 0 \rightarrow -1 - 2n \leq 0 \\ 2n &\leq -1 \\ n &\leq -\frac{1}{2} \end{aligned}$$

$$x \leq 1 \rightarrow f(k-1+m-1) \leq f(k+m-1) \leq 0$$

$$f(k+m) \leq 9 \xrightarrow{k=1} m \leq 8$$

$$\begin{aligned} k-2 < 0 &\rightarrow k < 2 \\ k \in \mathbb{N} &\rightarrow k = 1 \end{aligned}$$

$$\begin{aligned} \frac{m}{2} + k \\ \frac{3}{2} - \frac{1}{2} \\ \frac{1}{2} \end{aligned} \leq -1 + 1 = -1$$

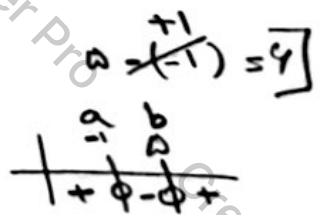
$$y = -\frac{1}{2}x^2 + 2x + 4$$

$$-\frac{1}{2}x^2 + 2x + 4 > \frac{1}{2} \rightarrow -\frac{1}{2}x^2 + 2x + 4 - \frac{1}{2} > 0$$

$$-x^2 + 4x + 7 - 1 > 0$$

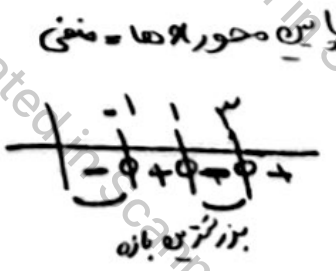
$$x^2 - 4x - 6 < 0$$

$$(x-6)(x+1) < 0 \rightarrow \begin{matrix} x < -1 \\ x < 6 \end{matrix}$$



$$\begin{array}{r} f(x) \leq \frac{x^2}{2} - 2x + 4 \\ \underline{-\frac{x^2}{2} + 2x + 4} \\ -2x^2 - 2x + 8 \\ \underline{-2x^2 + 4x + 8} \\ 6x \\ \underline{-6x + 12} \\ -2x + 12 \\ \underline{-2x + 12} \\ 0 \end{array}$$

$$\begin{aligned} x^2 - 4x - 6 &= (x-6)(x+1) \\ \Rightarrow (x-1)(x+1)(x-6) \\ x < -1 & \quad x < -1 \quad x < 6 \end{aligned}$$



$$f(2) \leq 1 - 12 - 2 + 12 = -3$$