

$$K(x-1)(x-3) = x^2 - ax + b$$

$$\rightarrow K=1 \Rightarrow x^2 - 4x + 3$$

$$\left. \begin{array}{l} a=4 \\ b=3 \end{array} \right\} a+b = 7$$

$$\begin{array}{c} 1 \quad 3 \\ + | - | + \\ \quad \quad \quad \checkmark \end{array}$$

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$$((K-2)x + m-1)(x-3n)^2$$

ریشه مخالف  $= -1 \Rightarrow -1 - 3n = 0 \Rightarrow 3n = -1 \Rightarrow n = -\frac{1}{3}$

تنها K می تواند باشد زیرا باید به ازای  $x$  بزرگ تر از  $m$  منفی باشد (K عددی طبیعی است)

$$\begin{array}{c|cc} x & -1 & 3 \\ \hline p & + & + \end{array}$$

$$-x + m - 1 \xrightarrow{\text{ریشه}} -4 + m - 1 = 0 \Rightarrow m = 5$$

$$\frac{m}{n} + K = \frac{5}{-\frac{1}{3}} + K = -15 + 1 = -14$$

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$$-\frac{1}{4}x^2 + 2x + 6 > \frac{1}{4} \rightarrow -\frac{1}{4}x^2 + 2x + \frac{23}{4} < 0$$

$$\xrightarrow{\times(-2)} x^2 - 4x - 23 < 0$$

$$(x-5)(x+1) < 0$$

$$\begin{array}{c} a \quad b \\ (-1 \quad 5) \\ \downarrow \\ \text{Max}(b-a) = 5 - (-1) = 6 \end{array}$$

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$$f(x) = x^2(x-3) - (x-3) \Rightarrow (x-3)(x-1)(x+1)$$

$$(x-3)(x+1)(x-1) < 0$$

$$\begin{array}{c} -1 \quad 1 \quad 3 \\ - | + | - | + \\ \Rightarrow (1 \quad 3) \Rightarrow \frac{3+1}{2} = 2 \end{array}$$

بزرگترین بازه

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

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

$$\Delta < 0 \Rightarrow a^2 - 2a + 1 - 4a + 4 < 0$$

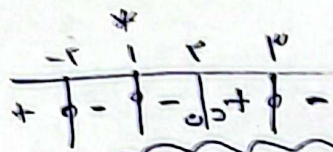
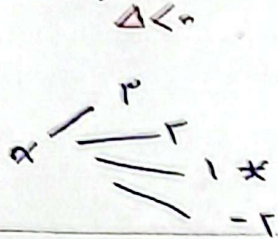
$$a^2 - 6a + 5 < 0 \Rightarrow (a-1)(a-5) < 0 \Rightarrow 1 < a < 5$$

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$$\frac{m(m(r+1))}{m-r} = \frac{m^r(m+1)}{m-r} > 0$$



$$\frac{(\alpha-r)(\alpha+r)(\alpha-1)^r}{(\alpha^r+x+1)(r-\alpha)^r} \leq 0$$



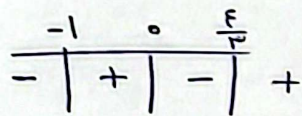
$$[r, +\infty)$$

$$\frac{r\alpha^r - r\alpha}{r^r + r} < r \Rightarrow \frac{r\alpha^r - r\alpha}{\alpha^r + r} - r < 0 \Rightarrow \frac{\alpha^r - r\alpha - r}{\alpha^r + r} < 0$$

$$\frac{(\alpha-r)(\alpha+r)}{\alpha^r + r} < 0 \Rightarrow (-r, r)$$

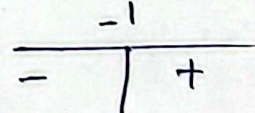
$$\frac{r\alpha^r - r\alpha}{\alpha + 1} < 0$$

$$\frac{\alpha(\alpha - r)}{\alpha + 1} < 0$$



$$\cap (\alpha < -1)$$

$$\frac{r\alpha^r - r\alpha}{\alpha + 1} + 1 < 0 \Rightarrow \frac{r\alpha^r - r\alpha + \alpha + 1}{\alpha + 1} < 0$$



$$\frac{\alpha^r - 1}{\alpha} \leq r \Rightarrow \frac{\alpha^r - 1}{\alpha} - r \leq 0$$

$$(-\infty, -r] \cup (0, \infty)$$

$$\frac{\alpha^r - r\alpha - 1}{\alpha} \leq 0 \Rightarrow \frac{(\alpha-r)(\alpha+r)}{\alpha} \leq 0$$

