

$x^2 < \alpha x + b$, $1 < x < 4$

۲. آزمون

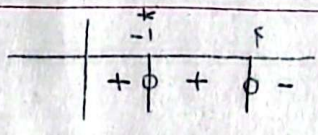
یک آزمون - دهم B

۱. چون ضریب x^2 یک است در نتیجه $\alpha = 1$ است

$y = a(x-1)(x-4) \rightarrow x^2 - 4x + 4 \rightarrow a = 1$, $b = 4 \rightarrow \alpha + b = 5$

۵

$y = ((k-2)x + m - 1)(x - 4n)^2$



$\frac{m}{n} + k = 8$

-۲

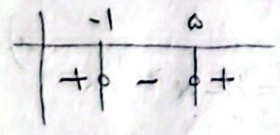
$x = -1 \rightarrow$ ریشه مضامف \rightarrow چون ریشه عوض نشود $\rightarrow -1 - 4n = 0 \rightarrow 4n = -1 \rightarrow n = -\frac{1}{4}$

$x = 4 \rightarrow$ ریشه عبارت درجه ۱ \rightarrow (در جدول تعیین علامت، علامت موان) $\rightarrow k - 2 < 0 \rightarrow k < 2$ $\rightarrow k \in \mathbb{N}$ $\rightarrow k = 1$

$(-x + m - 1) \xrightarrow{x=4} -4 + m - 1 = 0 \rightarrow m = 5$

$\frac{m}{n} + k = \frac{5}{-\frac{1}{4}} + 1 = -20 + 1 = -19$

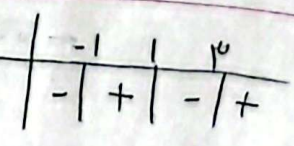
$y = -\frac{1}{4}x^2 + 2x + 5 \rightarrow y > \frac{1}{4} \Rightarrow -\frac{1}{4}x^2 + 2x + 5 > \frac{1}{4} \rightarrow -\frac{1}{4}x^2 + 2x - \frac{5}{4} > 0 \xrightarrow{\text{ضرب در ۴}} x^2 - 4x - 5 < 0$



$\Rightarrow -1 < x < 5 \rightarrow \alpha = -1$
 $(-1, 5)$ $b = 5 \rightarrow b - \alpha = 6$

۶

$f(x) = x^3 - 4x^2 - x + 4 \rightarrow x^2(x-4) - (x-4) = (x-1)(x+1)(x-4)$



-۳

I: $x > 0$ $\xrightarrow{I \cap II} (1, 4)$
 II: $f(x) < 0 \rightarrow$ نقطه میانی $= \frac{4+1}{2} = 2.5$

$f(2) = 8 - 16 - 2 + 4 = -6$

$$(x-1)x^r + (x-1)x + 1 < 0 \xrightarrow{\Delta} \Delta = b^2 - 4ac = \alpha^2 + 1 - 2\alpha - 4\alpha + 4 = \alpha^2 - 2\alpha + 1 = (\alpha-1)^2$$

$$\begin{array}{c|c|c} & 1 & \alpha \\ \hline & + & - \\ \hline & 0 & 0 \end{array}$$

$$\rightarrow x \in [1, \alpha]$$

$$\textcircled{1} x-1 < 0 \rightarrow x < 1$$

$$\textcircled{2} \Delta < 0 \rightarrow \emptyset$$

$$\alpha = 1 \mid, \alpha = \alpha$$

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

$$\rightarrow \Delta < 0 \rightarrow \frac{1}{2}$$

$$\begin{array}{c|c|c} & 0 & r \\ \hline & - & - \\ \hline & 0 & 0 \end{array}$$

$$\Rightarrow \text{D.R.} : (r, +\infty)$$

-4

$$\frac{(x-r)(x+r)(x-1)^r}{(x^r+x+1) - (x-r)^r} < 0 \xrightarrow{x(-1)} \frac{(x-r)(x+r)(x-1)^r}{(x-r)^r} > 0$$

$$\Delta < 0 \Rightarrow \frac{1}{2}$$

$$\begin{array}{c|c|c|c|c} & -r & 1 & r & r \\ \hline & - & + & + & - \\ \hline & 0 & 0 & 0 & 0 \end{array}$$

-5

$$\text{D.R.} = [-r, r) \cup [r, +\infty)$$

$$f(x) = \frac{rx^r - rx}{x^r + r}$$

$$f(x) < r \Rightarrow \frac{rx^r - rx - rx^r - r}{x^r + r} < 0 \rightarrow x^r - rx - r < 0 \rightarrow (x-r)(x+r) < 0$$

$$\frac{1}{2} \Delta < 0 \Rightarrow \Delta < 0$$

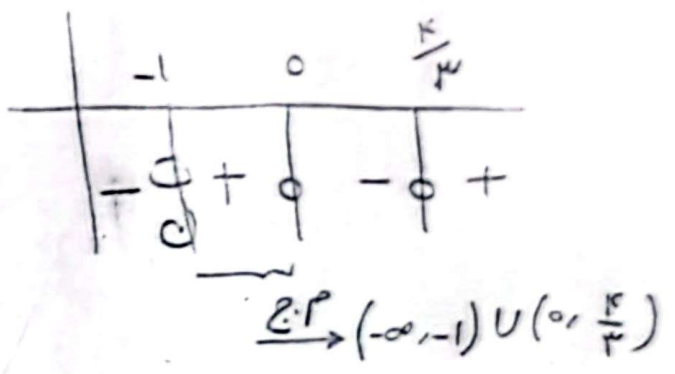
$$\begin{array}{c|c|c} & -r & r \\ \hline & + & - \\ \hline & 0 & 0 \end{array}$$

$$\Rightarrow (-r, r) = (a, b)$$

$$a = -r, b = r \Rightarrow b - a = 2r$$

-6

$$I) \frac{\mu x^r - kx}{x+1} < 0 \rightarrow \frac{x(\mu x - k)}{x+1} < 0$$



$$II) \frac{\mu x^r - kx + x + 1}{x+1} > 0$$

$\mu x^r - \mu x + 1 \rightarrow \Delta < 0 \rightarrow +0, 5E$

$\hookrightarrow x+1 > 0 \rightarrow \text{E.P. : } x > -1$

$\frac{\mu x^r - kx + 1}{x+1} > 0$

$(I), (II) \rightarrow (0, \frac{k}{\mu})$ ✓ ⊕

$$\frac{x^r - 1_0}{x} \leq \mu \Rightarrow \frac{x^r - \mu x - 1_0}{x} \leq 0 \rightarrow \frac{(x - a)(x + r)}{x} \leq 0$$

