

الف) $n^2 - 5n + 4 \xrightarrow{\times 4} n^2 - 5n + 4 \rightarrow (n-4)(n+1) \Rightarrow R' = 4, -1$
 ب) $n^2 - 1n - 3 \xrightarrow{\times 3} n^2 - 1n - 9 \rightarrow (n-4)(n+1) \Rightarrow R' = 4, -1$
 ج) $n^2 - 5n - 12 \xrightarrow{\times 4} n^2 - 5n - 12 \rightarrow (n-4)(n+1) \Rightarrow R' = 4, -1$
 د) $n^2 - 5n - 12 \xrightarrow{\times 4} n^2 - 5n - 12 \rightarrow (n-4)(n+1) \Rightarrow R' = 4, -1$
 $\Rightarrow R' = 1, 5 \Rightarrow R = 1, 5$

الف) $n^2 - 5n - 12 \Rightarrow (n-4)(n+1) \Rightarrow R = 4, -1$
 ب) $n^2 + 5n + 3 \xrightarrow{a+c=b} R_1 = -1, R_2 = \frac{3}{-1} = -3$
 ج) $n^2 + 5n + 3 \Rightarrow \Delta = 25 - 4(3) = -1, \Delta < 0 \Rightarrow$ ریشه حقیقی ندارد
 د) $n^2 + 5n - 2 \Rightarrow \Delta = 25 - 4(-2) = 33 \Rightarrow R = \frac{-5 \pm \sqrt{33}}{2}$

$A \times B = \{(1,2), (1,3), (2,2), (2,3), (3,2), (3,3)\}$
 $B \times B = \{(2,2), (2,3), (3,2), (3,3)\}$
 $\Rightarrow \{(1,2), (1,3)\}$

الف) $m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow m = -1, 2$
 if $m = 2 \Rightarrow (2, 4), (2, 1) \Rightarrow m \neq 2 \Rightarrow m = -1$
 ب) $m^2 = m + 2 \Rightarrow m = -1, 2$
 if $m = -1 \Rightarrow (-1, 4), (-1, 3) \Rightarrow m \neq -1$
 if $m = 2 \Rightarrow (2, 4), (2, 1) \Rightarrow m \neq 2$

$a^2 = 3a - 2 \Rightarrow a^2 - 3a + 2 = 0 \Rightarrow (a-2)(a-1) = 0$
 $\Rightarrow a = 2, 1$
 if $a = 1 \Rightarrow (1, 1), (1, 5) \Rightarrow a \neq 1$
 $\Rightarrow a = 2$

$$\begin{aligned} \text{For } n=2 &\Rightarrow r^2 = ra + b \Rightarrow 1 = ra + b \\ \text{For } n=1 &\Rightarrow r - r^0 = a + b \Rightarrow a = -b \end{aligned} \quad \left. \begin{array}{l} a=1 \\ b=-1 \end{array} \right\} \Rightarrow a \times b = 1 \times (-1) = \boxed{-1}$$

$$\begin{aligned} r_n - r^0 &= f - r_n^0 \Rightarrow \Delta n = V \Rightarrow n = \frac{V}{a} \\ &\Rightarrow k = \frac{V}{a} = \underline{1,5} \end{aligned}$$

$$\begin{aligned} \text{الف) } n=1 &\Rightarrow y^2 - 4y = 0 \Rightarrow y = 0, \sqrt{4} \Rightarrow \textcircled{X} \\ \text{ب) } n=0 &\Rightarrow y = r^0 - r^0 \Rightarrow \textcircled{X} \\ \text{ج) } n = \frac{\pi}{2} &\Rightarrow y = 1, -1 \Rightarrow \textcircled{X} \\ \text{د) } y^2 &= -n^2 - r_{n-1} \Rightarrow y^2 = -(n+1)^2 \Rightarrow D_f = \{ -1 \} \\ \text{For } n=-1 &\Rightarrow y=0 \Rightarrow \textcircled{V} \end{aligned}$$

$$\begin{aligned} \text{الف) } r_{n_1} - r^0 &= \sqrt[n]{y_1} \quad \text{If } n_1 = n_2 \quad \sqrt[n]{y_1} = \sqrt[n]{y_2} \Rightarrow y_1 = y_2 \Rightarrow \textcircled{V} \\ r_{n_2} - r^0 &= \sqrt[n]{y_2} \\ \text{ب) } \Delta n_1 &= y_1^r + r y_1 \quad \text{If } n_1 = n_2 \quad y_1^r + r y_1 = y_2^r + r y_2 \\ \Delta n_2 &= y_2^r + r y_2 \Rightarrow y_1^r - y_2^r + r(y_1 - y_2) \\ &\Rightarrow (y_1 - y_2)(y_1^r + y_2^r + y_1 y_2 + r) + r(y_1 - y_2) \\ &\Rightarrow (y_1 - y_2)(y_1^r + y_2^r + y_1 y_2 + r + r) \end{aligned}$$

$$y_1 = y_2 \Rightarrow \textcircled{V} \quad \leftarrow \text{خطه مثبت است} \quad \rightarrow \text{ریشه \Delta منفی و a نزدیک به صفر است}$$

$$\begin{aligned} \text{الف) } \text{If } n=0 &\Rightarrow 0 \times (\text{Sing}) = y \times 0 \Rightarrow \text{بسته به جواب} \quad \textcircled{X} \leftarrow \text{بسته به } y \\ \text{ب) } \deg \sqrt{\frac{n}{x}} &= a \end{aligned}$$

$$\begin{aligned} \Rightarrow \alpha + \frac{1}{\alpha} &= r \Rightarrow \alpha^2 + 1 = r\alpha \Rightarrow \alpha^2 - r\alpha + 1 = 0 \\ \textcircled{I} \Rightarrow \sqrt{\frac{n}{x}} &= 1 \Rightarrow \frac{n}{x} = 1 \Rightarrow n = x \Rightarrow (\alpha - 1)^2 = 0 \\ &\Rightarrow \alpha = 1 \leftarrow \textcircled{I} \end{aligned}$$