

الف) $\rightarrow y'' = -1 - x^2 \xrightarrow{x_1 = x_2} y_1'' = y_2'' \Rightarrow y_1' = y_2' \Rightarrow y_1 = y_2$ تابع هست

ب) $\xrightarrow{\text{تقریبی}} \text{if } x_1 = x_2 \rightarrow 4y_1^2 - 4y_2^2 = 4x - x^2 \rightarrow 4y_1^2 - 4y_2^2 = 4y_2^2 - 4y_1^2 \div 4$
 $y_1^2 - y_2^2 = y_2^2 - y_1^2 \rightarrow y_1^2 - y_2^2 - y_2^2 + y_1^2 = 0 \rightarrow y_1^2 - y_2^2 - 2y_2^2 + 2y_1^2 = 0$
 $(y_1 + y_2)(y_1 - y_2) = 0 \xrightarrow{y_1 + y_2 = 0} y_1 = -y_2$ تابع نیست

الف) $\text{if } x = 0 \rightarrow y \xrightarrow{\text{تقریبی}} \text{تابع نیست}$

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \quad x = y \neq 0$

الف) $y = \sqrt{\frac{x-1}{x-2}} + \sqrt{\frac{x-2}{x}} \xrightarrow{x=0} 0$
 $\begin{array}{c} 0 \quad 1 \quad 2 \quad 3 \\ + \quad + \quad - \quad - \\ \hline 2 \quad 2 \quad 2 \quad 2 \end{array} \quad D = (0, 1] \cup \{2\}$

ب) $\sqrt{y+1} = \sqrt{3-x} \quad D = [0, +\infty)$

الف) $\sqrt{x^2 - 7x + 6} \rightarrow \begin{array}{c} x^2 - 7x + 6 \rightarrow 0 \\ x^2 - 10x + 16 \rightarrow 0 \end{array} \xrightarrow{\text{تقریبی}} \begin{array}{c} 1 \quad 6 \\ + \quad - \quad + \\ \hline 2 \quad 2 \quad 2 \quad 2 \end{array} \quad ① \quad (-\infty, 1] \cup (6, +\infty)$
 $\xrightarrow{\text{تقریبی}} \begin{array}{c} 1 \quad 2 \quad 6 \quad 8 \\ + \quad - \quad + \quad - \\ \hline 2 \quad 2 \quad 2 \quad 2 \end{array} \quad ② \quad ① \cap ② \rightarrow \begin{array}{c} 1 \quad 6 \\ + \quad - \quad + \\ \hline 2 \quad 2 \quad 2 \quad 2 \end{array}$

ب) $\sqrt{\frac{x^2 - 7x + 6}{x^2 - 10x + 16}} \rightarrow \begin{array}{c} x^2 - 7x + 6 \rightarrow 0, 6 \\ x^2 - 10x + 16 \rightarrow 0, 2, 8 \end{array} \xrightarrow{\text{تقریبی}} \begin{array}{c} 1 \quad 2 \quad 6 \quad 8 \\ + \quad - \quad + \quad - \\ \hline 2 \quad 2 \quad 2 \quad 2 \end{array} \quad D = (-\infty, 1] \cup (6, 8] \cup (8, +\infty)$
 $D = (-\infty, 1) \cup [\frac{8}{3}, +\infty)$

الف) $\sqrt{2x^2 - 5x + 3} \rightarrow 1, \frac{3}{2} \rightarrow \infty$
 $\sqrt{3x^2 - 7x + 4} \rightarrow 1, \frac{4}{3} \rightarrow \infty$
 $\begin{array}{c} 2 \quad 3/2 \quad 4 \\ + \quad - \quad + \\ \hline 2 \quad 2 \quad 2 \quad 2 \end{array} \quad \begin{array}{c} 1 \quad 4/3 \quad 3/2 \\ + \quad - \quad + \\ \hline 2 \quad 2 \quad 2 \quad 2 \end{array}$
 $D = (-\infty, 1) \cup (1, \frac{4}{3}) \cup [\frac{3}{2}, +\infty)$

ب) $y = \sqrt{\frac{2x^2 - 5x + 3}{3x^2 - 7x + 4}} \rightarrow 1, \frac{3}{2}$
 $\sqrt{3x^2 - 7x + 4} \rightarrow 1, \frac{4}{3}$

$A = \{1, 2, 3\}$ $B = \{2, 3\}$ $A \times B = \{(1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)\}$ $B \times B = B^2 = \{(2, 2), (2, 3), (3, 2), (3, 3)\}$	$\left. \begin{array}{l} A \times B - B^2 \\ \longrightarrow \end{array} \right\} = \{(1, 2), (1, 3)\}$	۱
الف) $f(x) \rightarrow \{(2, m^2), \dots, (3, m+2), \dots\} \Rightarrow m^2 = m+2 \Rightarrow m^2 - m - 2 = 0$ $(m-2)(m+1) = 0 \Rightarrow m = 2 \vee -1 \rightarrow (2, 1) (m, \varepsilon) \rightarrow m \neq 2 \Rightarrow m = -1$ ب) $g(x) \rightarrow \{(3, m^2), \dots, (3, m+2), \dots\} \Rightarrow m^2 = m+2 \Rightarrow m^2 - m - 2 = 0$ $(m-2)(m+1) = 0 \rightarrow m = 2 \vee -1 \rightarrow$ <u>م به ازای هیچ مقداری صحیح نیست</u>		۲
$f(x) \begin{cases} x^2 - 1; x \leq 1 \\ ax + b; 1 < x < 2 \\ x^3; x \geq 2 \end{cases}$ if $x=1 \rightarrow 0 = a+b \Rightarrow a = -b$ if $x=2 \rightarrow 8 = 2a+b$ $a \times b = -9$	$\begin{cases} -a + b = 0 \\ 2a + b = 8 \end{cases}$ $a = 8$ $b = -8$	۳
$f(x) \begin{cases} 2x - 3; x \geq k \\ \varepsilon - 3x; x < k \end{cases}$ if $x=k \Rightarrow 2k - 3 = \varepsilon - 3k \Rightarrow 5k = \varepsilon$ $k = \frac{\varepsilon}{5}$		۴
$f(x) = \begin{cases} -x + 2; x > 1 \\ -x; -1 < x < 1 \\ x - 1; x < -1 \end{cases}$ $Df = \mathbb{R}$ $Rf = (-\infty, 1]$		۵