

الف) $\frac{x-1}{x-3} \geq 0 \Rightarrow \frac{1}{\phi - \frac{3}{\phi} +} \Rightarrow (-\infty, 1] \cup (3, +\infty) = I$ (٨)

ب) $\frac{x-2}{x} \geq 0 \Rightarrow \frac{0}{-\frac{2}{\phi} + \phi -} \Rightarrow (0, 2] = II$

$I \cap II = (0, 1] = D_f$

الف) $\sqrt{y-1} = -\sqrt{x} + \sqrt{3} \Rightarrow \sqrt{3} \geq \sqrt{x} \Rightarrow \boxed{x \leq 3}$

ب) $\boxed{x \geq 0}$

$I \cap II = [0, 3] = D_f$

الف) $x^2 - 7x + 6 \geq 0 \Rightarrow \frac{1}{\phi - \frac{6}{\phi} +} \Rightarrow I = (-\infty, 1] \cup [6, +\infty)$ (٩)

ب) $x - 10x + 16 \Rightarrow -9x + 16 > 0 \Rightarrow \frac{16}{9} > x \Rightarrow II = (-\infty, \frac{16}{9})$

$I \cap II = (-\infty, 1]$

الف) $\frac{(x-1)(x-6)}{(x-2)(x-8)} \geq 0 \Rightarrow \frac{1}{\phi - \frac{6}{\phi} +} \Rightarrow D_f = (-\infty, 1] \cup (2, 6] \cup (8, +\infty)$

الف) $2x^2 - 5x + 3 \geq 0 \Rightarrow \frac{5 \pm \sqrt{25 - 24}}{4} \Rightarrow x = \frac{3}{2}, x = 1 \Rightarrow \frac{1}{\phi - \frac{3}{\phi} +} \Rightarrow I = (-\infty, 1] \cup [\frac{3}{2}, +\infty)$ (١٠)

ب) $3x^2 - 7x + 4 > 0 \Rightarrow \frac{7 \pm \sqrt{49 - 48}}{6} \Rightarrow x = \frac{4}{3}, x = 1 \Rightarrow \frac{1}{\frac{4}{\phi} - \frac{3}{\phi} +} \Rightarrow II = (-\infty, 1) \cup (\frac{4}{3}, +\infty)$

$I \cap II = (-\infty, 1) \cup [\frac{3}{2}, +\infty) = D_f$

الف) $\frac{(x-1)(x-\frac{5}{2})}{(x-1)(x-\frac{4}{3})} \geq 0 \Rightarrow \frac{1}{\frac{5}{\phi} - \frac{4}{\phi} +} \Rightarrow D_f = (-\infty, 1) \cup (1, \frac{4}{3}) \cup [\frac{5}{2}, +\infty)$

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

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

الف) $m^2 = m + 2 \Rightarrow m^2 - m - 2 = 0 \Rightarrow \frac{1 \pm \sqrt{1+8}}{2} \Rightarrow \begin{matrix} 2 \\ -1 \end{matrix}$ $\xrightarrow{\text{غلق}}$ $\begin{matrix} (2,1), (2,4) \\ (-1,3), (-1,4) \end{matrix}$ $\Rightarrow m = -1$

ب) $m^2 = m + 2 \Rightarrow \Rightarrow m = 2$ $\xrightarrow{\text{غلق}}$ $(2,1), (2,4)$ $\Rightarrow m = -1$ $\xrightarrow{\text{غلق}}$ $(-1,3), (-1,4)$

مجموعه $g(x)$ به ازای هیچ مقدار m تابع نیست.

$f(x) = \begin{cases} x^2 - 1 & ; x \leq 1 \\ ax + b & ; 1 < x \leq 2 \\ x^2 & ; x > 2 \end{cases}$ $\xrightarrow{x=1} \bullet = a + b$ $\xrightarrow{x=2} \bullet = 2a + b$

$\Lambda = a \Rightarrow b = -\Lambda \Rightarrow axb = -64$ $axb = ?$

$x = K \Rightarrow 2K - 3 = 4 - 3K \Rightarrow 5K = 7 \Rightarrow K = \frac{7}{5}$

$f(x) = \begin{cases} -x + 2 & ; x > 1 \\ -x & ; -1 \leq x < 1 \\ x - 1 & ; x < -1 \end{cases}$

$D_f = \mathbb{R} - \{1\}$
 $R_f = (-\infty, 1]$

الف) $2y^3 + x^2 + 1 = 0 \xrightarrow{\text{تعریف}} \begin{cases} 2y_1^3 = -x^2 - 1 \\ 2y_2^3 = -x^2 - 1 \end{cases} \xrightarrow{y_1 = y_2} 2y_1^3 = 2y_2^3 \Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2$ تابع است

ب) $x^2 + 4y^2 - 2x - 12y + 10 = 0 \xrightarrow{\text{شکل}} (x^2 - 2x + 1) + (4y^2 - 12y + 9) = 0 \Rightarrow (x-1)^2 + (2y-3)^2 = 0$

تابع است زیرا که فقط نقطه $(1, \frac{3}{2})$ را نشان می‌دهد.

الف) $x = 0 \Rightarrow \bullet = y \sin 0^\circ \Rightarrow |1| |2| |3| \dots$ $\xrightarrow{\text{مثال نقیض}}$

دوین به ازای $x = 0$ بی شمار y وجود دارد پس تابع نیست.

ب) $(\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}})^2 = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{x}{y} \cdot \frac{y}{x}} = 2 \Rightarrow \frac{x^2 + y^2}{xy} = 2 \Rightarrow x^2 + y^2 = 2xy \Rightarrow x^2 - 2xy + y^2 = 0$

$\Rightarrow (x-y)^2 = 0 \Rightarrow x = y$ از آنجایی که $x = y$ دوین همواره به ازای یک و دقیقاً y وجود دارد پس تابع است.

