

$$\begin{aligned} x = y - 1 \xrightarrow{y=0} x = -1 \Rightarrow D = [-1, +\infty) \\ x = -y^2 \xrightarrow{y=1} x = -1 \quad D = (-\infty, 1) \end{aligned} \Rightarrow y = \begin{cases} \frac{x+1}{3} & x \geq -1 \\ \sqrt{-x} & x < -1 \end{cases}$$

(چون $y \geq 0$ را در نظر می‌گیریم)

با توجه به آنکه برای هر مقدار x حداقل یک مقدار y وجود دارد پس این رابطه تابع است

$$\frac{x f(x-2)}{f(x)} \geq 0 \quad f(x-2) = 0 \Rightarrow (7, 0) \quad (5, 0) \quad (-2, 0)$$

$$f(x) = 0 \Rightarrow (5, 0) \quad (3, 0) \quad (-4, 0)$$

$$\frac{-4}{-} \frac{5}{+} \frac{3}{-} \frac{0}{+} \frac{5}{-} \frac{7}{+} \Rightarrow (-4, -2] \cup [0, 3) \cup [7, +\infty) = D_{\text{gen}}$$

$$f(x) = \frac{x^2 - 3x + 2}{x(x-2)(x+2)} \Rightarrow D = \mathbb{R} - \{-2, 0, 2\}$$

$$\sqrt{f(x)} = \sqrt{\frac{x^2 - 3x + 2}{x(x-2)(x+2)}} \Rightarrow \frac{x^2 - 3x + 2}{x(x-2)(x+2)} \geq 0 \Rightarrow x(x-2)(x+2) \geq 0$$

$$\Rightarrow D = (-2, 0) \cup (2, +\infty)$$

$$\frac{x-2}{x^2 - 3x - 4} \geq 0 \Rightarrow \frac{(x-2)}{(x-2)(x+2)(x^2+2)} \geq 0 \Rightarrow \frac{-2}{-} \frac{2}{+} \frac{2}{+} \Rightarrow (-2, +\infty) - \{2\} = D_f$$

$$f: [-2] \neq 0 \quad [-2] \neq 2 \quad 2 < -x < 3 \Rightarrow -1 \geq x > -3 \Rightarrow \mathbb{R} - (-3, -2] = D_f$$

$$x(x^2 - 1) \geq 0 \Rightarrow \frac{-1}{-} \frac{1}{+} \frac{1}{+} \Rightarrow [-1, 0] \cup [1, +\infty) \quad |x| + x \geq 0 \Rightarrow x \geq 0 \quad \text{①} \cap \text{②} = [1, +\infty) = D_{f(x)}$$

$$|x-2| - x^2 \geq 0 \Rightarrow x^2 - x + 2 \geq 0 \quad \Delta = 1 - 8 = -7 < 0 \Rightarrow x \in \mathbb{R}$$

$$|x-1| \neq 0 \Rightarrow x \neq 1, -1$$

$$x^2 - x + 2 \geq 0 \Rightarrow [-2, 1] \quad \text{①} \cap \text{②} = [-2, 1) - \{-1\} = D_{f(x)}$$

$(x-1)[x-3] \geq 0 \xrightarrow{x-1=t} t[t-2] \geq 0 \Rightarrow t \leq 0 \text{ or } t \geq 2 \Rightarrow x \leq 1 \text{ or } x \geq 3$ $\frac{ x-1 }{x+1} \geq \frac{ x-3 }{x-1} \Rightarrow D = \{1\} \cup [3, +\infty)$	الف ٦
$ x-1-1 = k \xrightarrow{k \geq 0} x-2 = k \Rightarrow x-2 = k \Rightarrow x = k+2$ $\xrightarrow{k \geq 0} 1-x = k \Rightarrow x = 1-k$ $\xrightarrow{k \geq 0} x-2 = -k \Rightarrow x-2 = -k \Rightarrow x = 2-k$ $\xrightarrow{k \geq 0} 1-x = -k \Rightarrow x = 1+k$ تجاه صفر درست می باشد $k=0$	٧
$\left. \begin{aligned} x-1 \neq 0 &\Rightarrow x \neq 1 \\ \frac{x+1}{x-1} \neq 0 &\Rightarrow x \neq -1 \\ x^2+x+2 \neq 0 &\Rightarrow x \neq -2, -1 \end{aligned} \right\} \Rightarrow D_{f(x)} = \mathbb{R} - \{-2, -1, 1\} \Rightarrow n = 3$ $x^2 - 4x + 9 = 0 \Rightarrow (x-3)^2 = 0 \Rightarrow x = 3 \Rightarrow \text{یک جواب}$	٨
$x+1 > 0 \Rightarrow x > -1 \text{ (A)}, x+1 \neq 1 \Rightarrow x \neq 0 \Rightarrow (A) \cap (B) = (-1, +\infty) - \{0\}$ $x > 0, x \neq 1 \Rightarrow (0, +\infty) - \{1\} \text{ (B)}$ $\log_x \frac{1}{x} > 0 \Rightarrow 0 < x < 1 \text{ (C)}$ $\Rightarrow D_y = (A \cap B \cap C) = (0, 1)$	٩
$-2 \leq x^2 - 1 \leq 3 \Rightarrow -1 \leq x^2 \leq 4 \Rightarrow 0 \leq x^2 \leq 4 \Rightarrow 0 \leq x \leq \frac{4}{3}$ $x^2 \leq \frac{4}{3} \Rightarrow \frac{2}{\sqrt{3}} \leq x \leq \frac{2}{\sqrt{3}} \Rightarrow \frac{-2\sqrt{3}}{3} \leq x \leq \frac{2\sqrt{3}}{3}$	١٠