

الف) تابع $f(x) + 2$ تأثیر 2 واحد بالا می‌رود	ب) انبساط عمودی $2f(x)$	ج) تابع کمی به راست می‌رود $f(x-1)$	د) قرینه نسبت به محور x ها $-f(x)$	1
الف) $x^2 - 5x + 4 > 0 \rightarrow (x-2)(x-3) > 0$ $x = (-\infty, 2) \cup (3, +\infty)$	ج) $x^2 - 7x + 4 \leq 0 \rightarrow (x-1)(x-4) \leq 0$ $x = [1, 4]$	2		
الف) $\frac{x^2 - 3x + 2}{x - 5} < 0 \rightarrow \frac{(x-1)(x-2)}{x-5} < 0$ $x = (-\infty, 1) \cup (2, 5)$	ب) $\frac{x^2 - 1}{x^2 - 4x + 5} \geq 0 \rightarrow \frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0$ $x = (-\infty, -1] \cup (5, +\infty)$	3		
الف) $y = \sqrt{\frac{x^3 - 1}{x^3 - x}}$ مستقیم $y = \sqrt{\frac{(x-1)(x^2+1+x)}{x(x-1)(x+1)}}$ $D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$	ب) $y = \sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}} \rightarrow \sqrt{\frac{(x-4)(x+4)}{(x-1)(x-4)}}$ $D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$	4		
الف) $y = \sqrt{4 - \sqrt{2-x}}$ $4 - \sqrt{2-x} \geq 0 \rightarrow \sqrt{2-x} \leq 4$ $2-x \leq 16 \rightarrow x \geq -14$ $D_f = [-14, 2]$	ب) $y = \sqrt{3 - \sqrt{x-2}}$ $3 - \sqrt{x-2} \geq 0 \rightarrow \sqrt{x-2} \leq 3$ $x-2 \leq 9 \rightarrow x \leq 11$ $D_f = [2, 11]$	5		

$y = \sqrt{3 x - 9}$ $3 x - 9 \geq 0 \rightarrow 3 x \geq 9 \rightarrow x \geq 3$ $x \geq 3, x \leq -3$ $D_f = (-\infty -3] \cup [3 + \infty)$	$y = \sqrt{4 - 2x^2}$ $4 - 2x^2 \geq 0 \rightarrow 2x^2 \leq 4 \rightarrow x^2 \leq 2$ $\rightarrow -\sqrt{2} \leq x \leq \sqrt{2}$ $D_f = [-\sqrt{2} \quad \sqrt{2}]$	٦
$y = \sqrt[3]{\frac{\sqrt{x+1}}{\sqrt{x}-3}}$ $\rightarrow x \geq -1$ $\rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9$ $D_f = [0 + \infty) - \{9\}$	$y = \sqrt[3]{\frac{ x +1}{ x -3}}$ $\rightarrow x \neq 3 \rightarrow x \neq 3, -3$ $D_f = \mathbb{R} - \{-3, 3\}$	٧
$y = \frac{\cos x + 1}{2 \sin x + 1} \rightarrow \sin x \neq -\frac{1}{2}$  $D_f = \mathbb{R} - \{2k\pi - \frac{7\pi}{6}, 2k\pi - \frac{11\pi}{6}\}$	$y = \frac{\sin x}{2 \cos x - 1} \rightarrow \cos x \neq \frac{1}{2}$  $D_f = \mathbb{R} - \{2k\pi \pm \frac{\pi}{3}\}$	٨
$y = \frac{\sin x + 1}{2 \sin^2 x - 3} \rightarrow \sin^2 x \neq \frac{3}{2} \rightarrow \sin x \neq \pm \sqrt{\frac{3}{2}}$  $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4}\}$	$y = \frac{\tan x + 2}{\cot x - 1} \rightarrow \cot x \neq 1 \rightarrow \sin x \neq \cos x$  $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4}\}$	٩
$y = \frac{1}{\sqrt{2 x-2 - \frac{1}{2}}}$ $2 x-2 - \frac{1}{2} > 0 \rightarrow 2 x-2 > \frac{1}{2}$ $\rightarrow x-2 > \frac{1}{4}$ ① $x-2 < -\frac{1}{4} \rightarrow x < \frac{7}{4}$ ② $x-2 > \frac{1}{4} \rightarrow x > \frac{9}{4}$ $D_f = (-\infty \frac{7}{4}) \cup (\frac{9}{4} + \infty)$		٩
$y = \sqrt{\frac{ x }{ x }}$ } $\rightarrow$ همواره نامعنى $ x \neq 0 \rightarrow x \neq 0$ $D_f = \mathbb{R} - \{0\}$	$y = \sqrt{4 - 2 x }$ $4 - 2 x \geq 0 \rightarrow 2 x \leq 4 \rightarrow x \leq 2$ $-2 \leq x \leq 2$ $D_f = [-2 \quad 2]$	١٠