

الف) $f(x) + 2$ ۲ بالا		ج) $f(x-1)$ ۱ به راست		۱
ب) $2f(x)$		د) $-f(x)$ توسیع به x		۱
الف) $x^2 - 5x + 4 > 0$ $\rightarrow (x-2)(x-4) > 0$ $\rightarrow D_f = (-\infty, 2) \cup (4, +\infty)$		ج) $x^2 + 4x + 5 \geq 0$ $\rightarrow (x+5)(x+1) \geq 0$ $\rightarrow D_f = (-\infty, -5] \cup (-1, +\infty)$		۲
ب) $x^2 - 4x + 5 < 0$ $\rightarrow (x-1)(x-5) < 0$ $\rightarrow D_f = (1, 5)$		د) $x^2 - 7x + 4 < 0$ $\rightarrow (x-1)(x-4) < 0$ $\rightarrow D_f = [1, 4]$		۲
الف) $\frac{x^2 - 3x + 2}{x^2 - 4} < 0$ $\rightarrow \frac{(x-2)(x-1)}{(x-2)(x+2)} < 0$ $\rightarrow \frac{x-1}{x+2} < 0$ $\rightarrow D_f = (-\infty, -2) \cup (1, +\infty)$		ب) $\frac{x^2 - 1}{x^2 - 4x + 5} \geq 0$ $\rightarrow \frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0$ $\rightarrow \frac{x+1}{x-5} \geq 0$ $\rightarrow D_f = (-\infty, -1] \cup (5, +\infty)$		۳
الف) $y = \sqrt{\frac{x^3 - 1}{x^3 - x}} \rightarrow \frac{x^3 - 1}{x(x+1)(x-1)} \geq 0$ $\rightarrow D_f = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$		ب) $y = \sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}} \rightarrow \frac{(x+4)(x-4)}{(x-4)(x-1)} \geq 0$ $\rightarrow \frac{x+4}{x-1} \geq 0$ $\rightarrow D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$		۴
الف) $y = \sqrt{4 - \sqrt{x-1}}$ $\rightarrow 4 - \sqrt{x-1} \geq 0 \rightarrow \sqrt{x-1} \leq 4$ $\rightarrow 2 - \sqrt{x-1} \geq 0 \rightarrow \sqrt{x-1} \leq 2$ $\rightarrow 2 \geq x \geq -14 \Rightarrow D_f = [-14, 2]$		ب) $y = \sqrt{3 - \sqrt{x-2}}$ $\rightarrow \sqrt{x-2} \geq 0 \rightarrow x \geq 2$ $\rightarrow 3 - \sqrt{x-2} \geq 0 \rightarrow \sqrt{x-2} \leq 3 \rightarrow x - 2 \leq 9$ $\rightarrow x \leq 11$ $\Rightarrow D_f = [2, 11]$		۵

ا) $y = \sqrt{t - 2u^2} \rightarrow t - 2u^2 \geq 0$ $\rightarrow 2u^2 \leq t \rightarrow u^2 \leq \frac{t}{2} \rightarrow u \leq \pm \sqrt{\frac{t}{2}}$ $D_f = [-\sqrt{t}, +\sqrt{t}]$	ب) $y = \sqrt{r u - a} \rightarrow r u - a \geq 0$ $\rightarrow r u \geq a$ $D_f = (-\infty, -\frac{a}{r}] \cup [\frac{a}{r}, +\infty)$	4
ا) $y = \sqrt{\frac{ u +1}{ u -r}} \rightarrow u \neq r \rightarrow u \neq \pm r$ $D_f = (-\infty, -r) \cup (-r, r) \cup (r, +\infty)$	ب) $y = \sqrt{\frac{\sqrt{u}+1}{\sqrt{u}-r}} \rightarrow \sqrt{u} > r \rightarrow u > r^2$ $\rightarrow \sqrt{u} \geq 0 \rightarrow u \geq 0$ $D_f = [0, r^2) \cup (r^2, +\infty)$	5
ا) $y = \frac{\sin u}{r \cos u - 1} \rightarrow r \cos u \neq 1 \rightarrow \cos u \neq \frac{1}{r}$ $D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{r}\}$	ج) $y = \frac{\tan u + r}{\cot u - 1} \rightarrow \cot u \neq 1 \rightarrow \sin u \neq \cos u$ $D_f = \mathbb{R} - \{\frac{k\pi}{r}, k\pi + \frac{\pi}{r}\}$	6
ب) $y = \frac{\cos u + 1}{r \sin u + 1} \rightarrow r \sin u \neq -1 \rightarrow \sin u \neq -\frac{1}{r}$ $D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{r}\}$	د) $y = \frac{\sin u + 1}{r \sin^2 u - r} \rightarrow \sin^2 u \neq \frac{r}{r} \rightarrow \sin u \neq \pm \frac{\sqrt{r}}{r}$ $D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{r}\}$	
$y = \frac{1}{\sqrt{r u-r - \frac{1}{r}}} \rightarrow r u-r - \frac{1}{r} > 0 \rightarrow r u-r > \frac{1}{r} \rightarrow u-r > \frac{1}{r^2}$ $\rightarrow u - r < -\frac{1}{r^2}, u - r > \frac{1}{r^2} \rightarrow \underline{u < r - \frac{1}{r^2}, u > r + \frac{1}{r^2}}$ $\Rightarrow D_f = (-\infty, r - \frac{1}{r^2}) \cup (r + \frac{1}{r^2}, +\infty)$		9
ا) $y = \sqrt{t - 2 u } \rightarrow t - 2 u \geq 0$ $\rightarrow t \geq 2 u \rightarrow t \geq u \rightarrow \underline{-t \leq u \leq t}$ $\Rightarrow D_f = [-t, t]$	ب) $y = \sqrt{\frac{ u }{ u }} \rightarrow \frac{ u }{ u } \geq 0, u \neq 0$ $\Rightarrow D_f = \mathbb{R} - \{0\}$	10