

الف) $f(x) + 2$	ب) $2f(x)$	ج) $f(x-1)$	د) $-f(x)$	۱
$x^2 - 5x + 4 > 0$ $(x-2)(x-3) > 0$ $\begin{array}{c ccc} x & 2 & 3 & \\ \hline y & + & - & + \end{array}$ $D_f = (-\infty, 2) \cup (3, \infty)$	$x^2 - 4x + 4 < 0$ $(x-1)(x-4) < 0$ $\begin{array}{c ccc} x & 1 & 4 & \\ \hline y & + & - & + \end{array}$ $D_f = (1, 4)$	$x^2 + x + 4 \geq 0$ $(x+1)(x+4) \geq 0$ $\begin{array}{c ccc} x & -4 & -1 & \\ \hline y & + & - & + \end{array}$ $D_f = (-\infty, -4] \cup [-1, \infty)$	$x^2 - 4x + 4 \leq 0$ $(x-1)(x-4) \leq 0$ $\begin{array}{c ccc} x & 1 & 4 & \\ \hline y & + & - & + \end{array}$ $D_f = [1, 4]$	۲
الف) $\frac{x^2 - 3x + 2}{x - 5} < 0$ $\frac{(x-1)(x-2)}{x-5} < 0$ $\begin{array}{c cccc} x & 1 & 2 & 5 & \\ \hline y & - & + & - & + \end{array}$ $D_f = (-\infty, 1) \cup (2, 5)$	ب) $\frac{x^2 - 1}{x^2 - 4x + 4} \geq 0$ $\frac{(x-1)(x+1)}{(x-1)(x-4)} \geq 0$ $\begin{array}{c cccc} x & -1 & 1^* & 4 & \\ \hline y & + & - & - & + \end{array}$ $D_f = (-\infty, -1] \cup (4, \infty)$			۳
الف) $y = \sqrt{\frac{x^2 - 1}{x^2 - 4x + 4}}$ $\frac{x^2 - 1}{x^2 - 4x + 4} \geq 0 \Rightarrow x \neq 1 \Rightarrow x \neq 1$ $* x^2 - 4x + 4 = (x-2)^2 \Rightarrow x \neq 2$ $\begin{array}{c ccc} x & -1 & 0 & 1^* & \\ \hline y & + & - & + & \end{array}$ $D_f = (-\infty, -1) \cup (0, 1) \cup (1, 2) \cup (2, \infty)$	ب) $y = \sqrt{\frac{x^2 - 1}{x^2 - 4x + 4}}$ $D_f = (-\infty, -1] \cup (1, 2) \cup (2, \infty)$ ① $x^2 - 1 = (x-1)(x+1) \Rightarrow x \neq 1, x \neq -1$ ② $x^2 - 4x + 4 = (x-2)^2 \Rightarrow x \neq 2$ $\begin{array}{c ccc} x & -1 & 1 & 2^* & \\ \hline y & + & - & + & \end{array}$			۴
الف) $y = \sqrt{2x - \sqrt{3x - 2}}$ $\begin{array}{c} 2x - \sqrt{3x - 2} \geq 0 \\ \frac{2x}{\sqrt{3x - 2}} \geq 0 \end{array} \Rightarrow D_f = [-1, 2]$ ① $\begin{array}{c cc} x & 2 & \\ \hline y & + & - \end{array}$ ② $\begin{array}{c cc} x & -1 & \\ \hline y & - & + \end{array}$	ب) $y = \sqrt{2 - \sqrt{x - 2}}$ $\begin{array}{c} 2 - \sqrt{x - 2} \geq 0 \\ \frac{2}{\sqrt{x - 2}} \geq 0 \end{array} \Rightarrow D_f = [2, 11]$ ① $\begin{array}{c cc} x & 2 & \\ \hline y & - & + \end{array}$ ② $\begin{array}{c cc} x & 11 & \\ \hline y & + & - \end{array}$			۵

$الف) y = \sqrt{2-2x}$ $\Rightarrow 2 x = 2$ $\Rightarrow x = 1$ $\Rightarrow x = \pm 1$ $D_f = [-1, 2]$	$ب) y = \sqrt{3 x -9}$ $\Rightarrow 3 x = 9$ $\Rightarrow x = 3$ $\Rightarrow x = \pm 3$ $D_f = (-\infty, -3] \cup [3, +\infty)$	۶
$الف) y = \sqrt{\frac{ x +1}{ x -3}}$ رادیكال با فرجه $\sqrt{\quad}$ محدودیت علاقه ندارد و در نتیجه جدول تعیین علامت نیاز نیست ... $ x -3=0$ $\Rightarrow x =3$ $\Rightarrow x = \pm 3$ $D_f = \mathbb{R} - \{\pm 3\}$	$ب) y = \sqrt{\frac{3x+1}{\sqrt{x}-3}}$ مانند سوال قبل به جدول تعیین علامت نیاز نداریم $\sqrt{x}-3=0$ $\Rightarrow \sqrt{x}=3$ $\Rightarrow x=9$ $D_f = \mathbb{R} - \{9\}$	۷
$الف) y = \frac{\sin x}{2\cos x - 1}$ $2\cos x = 1$ $\cos x = \frac{1}{2}$ $D_f = \mathbb{R} - \{2k\pi - \frac{\pi}{3}, 2k\pi + \frac{\pi}{3}\}$	$ب) y = \frac{\cos x + 1}{2\sin x + 1}$ $2\sin x = -1$ $\sin x = -\frac{1}{2}$ $D_f = \mathbb{R} - \{2k\pi - \frac{\pi}{6}, 2k\pi + \frac{7\pi}{6}\}$	۸
$الف) y = \frac{1}{\sqrt{2 x-1 -\frac{1}{2}}}$ $2 x-1 = \frac{1}{2}$ $ x-1 = \frac{1}{4}$ $x-1 = \pm \frac{1}{4} \Rightarrow x = 1 \pm \frac{1}{4} \Rightarrow x = \frac{5}{4} \text{ و } \frac{3}{4}$ $D_f = (-\infty, \frac{3}{4}) \cup (\frac{5}{4}, +\infty)$		۹
$الف) y = \sqrt{4-2 x }$ $2 x = 4$ $ x = 2$ $D_f = [-2, 2]$	$ب) y = \sqrt{\frac{1}{ x }} \Rightarrow$ همواره مثبت $D_f = \mathbb{R} - \{0\}$	۱۰