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الف	ب	ج	د	۱
الف) $(x-1)(x-3) > 0$ $\begin{array}{c cc} & 1 & 3 \\ \hline + & - & + \end{array}$ $(-\infty, 1) \cup (3, +\infty)$	ب) $(x-1)(x-3) < 0$ $\begin{array}{c cc} & 1 & 3 \\ \hline + & - & + \end{array}$ $(1, 3)$	ج) $(x+1)(x+3) > 0$ $\begin{array}{c cc} & -1 & -3 \\ \hline + & - & + \end{array}$ $(-\infty, -3] \cup [-1, +\infty)$	د) $(x-1)(x-4) < 0$ $\begin{array}{c cc} & 1 & 4 \\ \hline + & - & + \end{array}$ $(1, 4)$	۲
الف) $\frac{(x-1)(x-2)}{x-5} < 0$ $\begin{array}{c ccc} & 1 & 2 & 5 \\ \hline - & + & - & + \end{array}$ $\Rightarrow (2, 5) \cup (-\infty, 1)$	ب) $\frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0$ $\begin{array}{c ccc} & -1 & 1 & 5 \\ \hline + & - & - & + \end{array}$ $(-\infty, -1] \cup (5, +\infty)$			۳
الف) $x^2 - 1 \geq 0$ $x^2 - 1 = 0$ $x = 1$ $x^2 - x \geq 0$ $x^2(x-1) \Rightarrow x = 1$ $x = 0$ $\begin{array}{c cc} & 0 & 1 \\ \hline - & + & - \end{array}$ $D_f = (0, 1) \cup (1, +\infty)$	ب) $\frac{(x-4)(x+4)}{(x-1)(x-4)} \geq 0$ $\begin{array}{c ccc} & -4 & 1 & 4 \\ \hline + & - & + & + \end{array}$ $D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$			۴
الف) $4 - \sqrt{4-x} \geq 0 \rightarrow \sqrt{4-x} \leq 4$ $4-x \leq 16$ $x \geq -12$ $4-x \geq 0 \rightarrow x \leq 4$ $D_f = [-12, 4]$	الف) $3 - \sqrt{u-2} \geq 0 \rightarrow \sqrt{u-2} \leq 3$ $u-2 \leq 9$ $u \leq 11$ $u-2 \geq 0 \rightarrow u \geq 2$ $D_f = [2, 11]$			۵

$\begin{aligned} & -2 \leq x \leq 2 \\ & x^2 \leq 4 \\ & x^2 \leq 2 \\ & -\sqrt{2} \leq x \leq \sqrt{2} \\ & \Rightarrow [-\sqrt{2}, \sqrt{2}] \end{aligned}$ الف) (ب) ✓	$\begin{aligned} & 3 x - 9 \geq 0 \quad 3 x \geq 9 \\ & x \geq 3 \\ & x \geq 3 \\ & x \leq -3 \\ & \Rightarrow [3, +\infty) \cup (-\infty, -3] \end{aligned}$ ب) (ب) ✓	6		
$\begin{aligned} & x - 3 \neq 0 \\ & x \neq 3 \\ & x \neq -3 \\ & D_f = \mathbb{R} - \{\pm 3\} \end{aligned}$ الف) 1, 5	$\begin{aligned} & \sqrt{x} - 3 \neq 0 \quad \text{البيكال بايد تعريف شود} \\ & \sqrt{x} \geq 0 \quad \text{و } x \geq 0 \\ & \sqrt{x} \geq 3 \Rightarrow x \geq 9 \\ & x \geq 9 \\ & x \neq 9 \\ & D_f = \mathbb{R} - \{9\} \end{aligned}$ ب) [9, +\infty)	7		
$\begin{aligned} & 2\cos x - 1 \neq 0 \\ & \cos x \neq \frac{1}{2} \\ & D_f = \mathbb{R} - \left\{2k\pi \pm \frac{\pi}{3}\right\} \end{aligned}$ الف) (ب) ✓	$\begin{aligned} & 2\sin x + 1 \neq 0 \\ & \sin x \neq -\frac{1}{2} \\ & D_f = \mathbb{R} - \left\{2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6}\right\} \end{aligned}$ ب) (ب) ✓	$\begin{aligned} & \cot x - 1 \neq 0 \\ & \cot x \neq 1 \\ & \cos x \neq \sin x \\ & D_f = \mathbb{R} - \left\{k\pi, k\pi + \frac{\pi}{4}\right\} \end{aligned}$ ب) (ب) ✓	$\begin{aligned} & \sqrt{\sin^2 x - 1} \neq 0 \\ & \sin^2 x \neq \frac{1}{4} \\ & \sin x \neq \pm \sqrt{\frac{1}{4}} \\ & D_f = \mathbb{R} - \left\{k\pi \pm \frac{\pi}{6}\right\} \end{aligned}$ ب) (ب) ✓	8
$\begin{aligned} & 2 x-1 - \frac{1}{x} > 0 \\ & 2 x-1 > \frac{1}{x} \\ & x-1 > \frac{1}{2x} \\ & \Rightarrow x-1 > \frac{1}{2x} \end{aligned}$ الف) (ب) ✓	$\begin{aligned} & (1) \rightarrow x > \frac{1}{2} \\ & (2) \rightarrow x < \frac{1}{2} \end{aligned}$ ب) (ب) ✓	$D_f = (-\infty, \frac{1}{2}) \cup (\frac{1}{2}, +\infty)$ ب) (ب) ✓	9	
$\begin{aligned} & -2 \leq x \leq 2 \\ & x \leq 2 \\ & -2 \leq x \leq 2 \\ & D_f = [-2, 2] \end{aligned}$ الف) (ب) ✓	$\begin{aligned} & \frac{ x }{ x } \geq 0 \rightarrow \text{مستقيم} \\ & x \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\} \end{aligned}$ ب) (ب) ✓	10		