

(الف)	(ب) ✓	(ج)	(د)	۱
(الف) $x^2 - 5x + 4 > 0$ $(x-1)(x-4) > 0$ $(-\infty, 1) \cup (4, +\infty)$	(ب) $(x-1)(x-5) < 0$ $(1, 5)$ ✓	(ج) $(x+1)(x+5) \geq 0$ $(-\infty, -5] \cup [-1, +\infty)$	(د) $(x-1)(x-4) \leq 0$ $[1, 4]$	۲
(الف) $\frac{(x-1)(x-2)}{(x-5)} < 0$ $\Rightarrow (1, 2) \cup (5, +\infty)$ ✓	(ب) $\frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0$ $\Rightarrow (5, +\infty) \cup (-\infty, -1]$	(ج) $\frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0$ $\Rightarrow (5, +\infty) \cup (-\infty, -1]$	(د) $\frac{(x-1)(x+1)}{(x-1)(x-5)} \geq 0$ $\Rightarrow (5, +\infty) \cup (-\infty, -1]$	۳
(الف) $x^3 - 1 \geq 0$ $x^3 - 1 = (x-1)(x^2+x+1)$ $x^2+x+1 > 0$ (always true) $x-1 \geq 0 \Rightarrow x \geq 1$ $P_f = [1, +\infty)$	(ب) $x^3 - 1 = 0 \Rightarrow x = 1$ $x^3 - 1 = (x-1)(x^2+x+1)$ $x^2+x+1 > 0$ (always true) $x-1 = 0 \Rightarrow x = 1$ $P_f = \{1\}$	(ج) $x^3 - 1 \geq 0$ $x^3 - 1 = (x-1)(x^2+x+1)$ $x^2+x+1 > 0$ (always true) $x-1 \geq 0 \Rightarrow x \geq 1$ $P_f = [1, +\infty)$ ✓	(د) $x^3 - 1 \geq 0$ $x^3 - 1 = (x-1)(x^2+x+1)$ $x^2+x+1 > 0$ (always true) $x-1 \geq 0 \Rightarrow x \geq 1$ $P_f = [1, +\infty)$	۴
(الف) $4 - \sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 4$ $2-x \leq 16 \Rightarrow x \geq -14$ $2-x \geq 0 \Rightarrow x \leq 2$ $P_f = [-14, 2]$ ✓	(ب) $4 - \sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 4$ $2-x \leq 16 \Rightarrow x \geq -14$ $2-x \geq 0 \Rightarrow x \leq 2$ $P_f = [-14, 2]$	(ج) $4 - \sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 4$ $2-x \leq 16 \Rightarrow x \geq -14$ $2-x \geq 0 \Rightarrow x \leq 2$ $P_f = [-14, 2]$	(د) $4 - \sqrt{2-x} \geq 0 \Rightarrow \sqrt{2-x} \leq 4$ $2-x \leq 16 \Rightarrow x \geq -14$ $2-x \geq 0 \Rightarrow x \leq 2$ $P_f = [-14, 2]$	۵

$r - r^2 \geq 0$ $r^2 \leq r$ $r^2 \leq r$ $-\sqrt{r} \leq r \leq \sqrt{r} \Rightarrow [-\sqrt{r}, \sqrt{r}]$	(و) $r^2 n - 1 \geq 0$ $r^2 n \geq 1$ $ n \geq \frac{1}{r}$ $n \geq \frac{1}{r} \Rightarrow [\frac{1}{r}, +\infty) \cup (-\infty, -\frac{1}{r}]$ $n \leq -\frac{1}{r}$	(ب)	٤	
$ n \neq r$ $n \neq \pm r \Rightarrow D_f = \mathbb{R} - \{\pm r\}$	(و) $n \geq 0$ $\sqrt{n} \neq r \Rightarrow D_f = [0, r) \cup (r, +\infty)$ $n \neq r$	(ب)	٧	
$r \cos n - 1 \neq 0$ (و) $r \cos n \neq 1$ $\cos n \neq \frac{1}{r}$ $D_f = \mathbb{R} - \{r k \pi \pm \frac{\pi}{r}\}$	$r \sin n + 1 \neq 0$ (ب) $r \sin n \neq -1$ $\sin n \neq -\frac{1}{r}$ $D_f = \mathbb{R} - \{r k \pi + \frac{\pi}{4}, r k \pi + \frac{11\pi}{4}\}$	$\cot n - 1 \neq 0$ (ج) $\cot n \neq 1$ $\cos \neq \sin$ $D_f = \mathbb{R} - \{k \pi, k \pi + \frac{\pi}{2}, k \pi + \frac{\pi}{4}\}$	$r^2 \sin^2 n - r^2 \neq 0$ (د) $r^2 \sin^2 n \neq r^2$ $\sin^2 n \neq \frac{r^2}{r^2}$ $\sin n \neq \pm \frac{\sqrt{r}}{r}$ $D_f = \mathbb{R} - \{k \pi \pm \frac{\pi}{r}\}$	٨
$r n - r - \frac{1}{r} > 0$ $\Rightarrow r n - r > \frac{1}{r}$ $\Rightarrow n - r > \frac{1}{r^2} \rightarrow \begin{cases} n - r > \frac{1}{r^2} \rightarrow n > \frac{r^2 + 1}{r^2} \\ n - r < -\frac{1}{r^2} \rightarrow n < \frac{r^2 - 1}{r^2} \end{cases}$	$\Rightarrow D_f = (-\infty, \frac{r^2 - 1}{r^2}) \cup (\frac{r^2 + 1}{r^2}, +\infty)$	(و)	٩	
$r - r n \geq 0$ $r n \leq r$ $ n \leq 1$ $-1 \leq n \leq 1 \Rightarrow D_f = [-1, 1]$	(و) $\frac{ n }{ n } \geq 0 \rightarrow \text{مطلوبه}$ $n \neq 0 \Rightarrow D_f = \mathbb{R} - \{0\}$	(ب)	١٠	