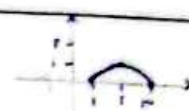


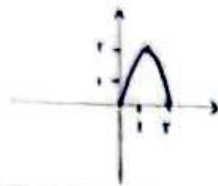
الف)



ج)



ب)



۲ ✓

د)



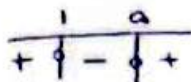
۱

الف) $(x-1)(x-3) > 0$



$D_f = (-\infty, 1) \cup (3, +\infty)$

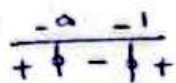
ب) $(x-1)(x-3) < 0$



$D_f = (1, 3)$

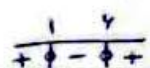
۲ ✓

ج) $(x+1)(x+3) \geq 0$



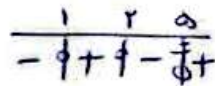
$D_f = (-\infty, -3] \cup [-1, +\infty)$

د) $(x-1)(x-4) \leq 0$



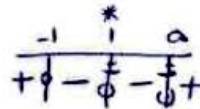
$D_f = [1, 4]$

الف) $\frac{(x-1)(x-2)}{x-3} < 0$



$D_f = (-\infty, 1) \cup (2, 3)$

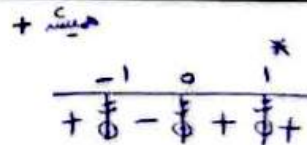
ب) $\frac{(x-1)(x+1)}{(x-1)(x-3)} \geq 0$



$D_f = (-\infty, -1] \cup (3, +\infty)$

۲ ✓

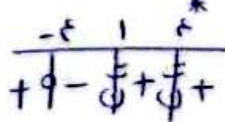
الف) $\frac{x^3-1}{x^3-x} \geq 0 \rightarrow \frac{(x-1)(x^2+x+1)}{x(x-1)(x+1)} \geq 0$



$D_f = (-\infty, -1) \cup (1, +\infty)$

۲ ✓

ب) $\frac{(x-4)(x+4)}{(x-1)(x-4)} \geq 0$



$D_f = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$

الف) $\begin{cases} 2-x \geq 0 \rightarrow x \leq 2 \\ 4-\sqrt{2-x} \geq 0 \rightarrow \sqrt{2-x} \leq 4 \rightarrow 2-x \leq 14 \rightarrow x \geq -12 \end{cases} \Rightarrow -12 \leq x \leq 2 \rightarrow D_f = [-12, 2]$

۲ ✓

ب) $\begin{cases} x-2 \geq 0 \rightarrow x \geq 2 \\ 3-\sqrt{x-2} \geq 0 \rightarrow \sqrt{x-2} \leq 3 \rightarrow x-2 \leq 9 \rightarrow x \leq 11 \end{cases} \Rightarrow 2 \leq x \leq 11 \rightarrow D_f = [2, 11]$

✓

الف) $4 - 2x^2 \geq 0 \rightarrow 2x^2 \leq 4 \rightarrow x^2 \leq 2 \rightarrow -\sqrt{2} \leq x \leq \sqrt{2} \quad D_f = [-\sqrt{2}, \sqrt{2}]$

② ✓

ب) $3|x| - 9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \Rightarrow x \leq -3, x \geq 3 \quad D_f = (-\infty, -3] \cup [3, +\infty)$

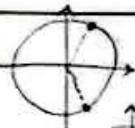
الف) $|x| - 3 \neq 0 \rightarrow |x| \neq 3 \rightarrow x \neq \pm 3 \quad D_f = (-\infty, -3) \cup (-3, 3) \cup (3, +\infty)$

ب) $x \geq 0$

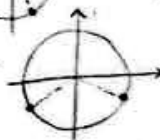
② ✓

$\sqrt{x} - 3 \neq 0 \rightarrow \sqrt{x} \neq 3 \rightarrow x \neq 9 \quad D_f = [0, 9) \cup (9, +\infty)$

الف) $2\cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{2} \quad D_f = \mathbb{R} - \left\{ 2k\pi \pm \frac{\pi}{3} \right\}$



ب) $2\sin x + 1 \neq 0 \rightarrow \sin x \neq -\frac{1}{2}$



$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6} \right\}$

ج) $\begin{cases} \cos x \neq 0 \\ \sin x \neq 0 \end{cases}$

② ✓

$\cot x - 1 \neq 0 \rightarrow \cot x \neq 1$



$D_f = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4} \right\}$

د) $5\sin^2 x - 3 \neq 0 \rightarrow \sin^2 x \neq \frac{3}{5} \rightarrow \sin x \neq \pm \frac{\sqrt{5}}{\sqrt{5}} \quad D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2}, k\pi + \frac{3\pi}{2} \right\}$



$2|x-2| - \frac{1}{2} > 0 \rightarrow 2|x-2| > \frac{1}{2} \rightarrow |x-2| > \frac{1}{4} \xrightarrow{\text{C3}} x-2 < -\frac{1}{4}, x-2 > \frac{1}{4} \rightarrow x < \frac{7}{4}, x > \frac{9}{4}$

$x > \frac{9}{4} \quad D_f = (-\infty, \frac{7}{4}) \cup (\frac{9}{4}, +\infty)$

② ✓

الف) $4 - 2|x| \geq 0 \rightarrow 2|x| \leq 4 \rightarrow |x| \leq 2 \rightarrow -2 \leq x \leq 2 \Rightarrow D_f = [-2, 2]$

② ✓

ب) $|x| \neq 0 \rightarrow (-\infty, 0) \cup (0, +\infty)$