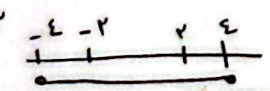
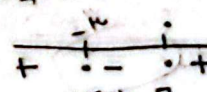
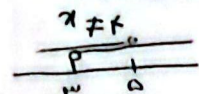
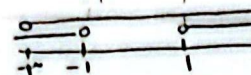
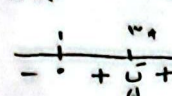
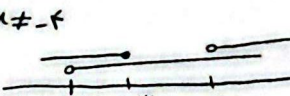
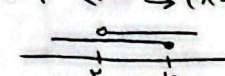
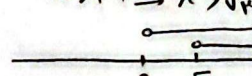


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الف) $\frac{\sin x - 2}{2 \cos x + 1}$ $2 \cos x + 1 \neq 0$ $\cos x \neq -\frac{1}{2}$  $\mathbb{R} - \{2k\pi \pm \frac{2\pi}{3}\}$	ب) $y = \frac{\sin x + 3}{\cos - 1}$ $\cos - 1 \neq 0 \rightarrow \cos \neq 1$  $\mathbb{R} - \{2k\pi\}$	۱
الف) $\frac{2 \sin x + 1}{\tan x + 1}$ $\tan x \neq -1 \rightarrow \frac{\sin x}{\cos x} \neq -1$ $\cos x \neq 0$  $\mathbb{R} - \{k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4}\}$	ب) $\frac{\cos x + 1}{\cot x - 1}$ $\cot x \neq 1 \rightarrow \frac{\cos x}{\sin x} \neq 1$ $\sin x \neq 0$  $\mathbb{R} - \{k\pi, k\pi + \pi\}$	۲
الف) $-1 \leq x^2 - 2 \leq 1$ $1 \leq x^2 \quad x^2 \leq 3$ $1 \leq x \quad \sqrt{3} \leq x \leq \sqrt{3}$ $-1 \geq x$  $[-\sqrt{3}, -1] \cup [1, \sqrt{3}]$	ب) $-1 \leq \sqrt{x} - 3 \leq 1$ $2 \leq \sqrt{x} \rightarrow 4 \leq x$ $\sqrt{x} \leq 4 \rightarrow x \leq 16$  $[4, 16]$	۳
$\cos y = x - 3$ $-1 \leq x - 3 \leq 1$ $2 \leq x \quad x \leq 4$ $2 \leq x \quad -4 \leq x \leq -2$  $[-4, -2] \cup [2, 4]$	ب) $-1 \leq x^2 + 3x + 1 \leq 1$ $-2 \leq x(x + 3)$ $x^2 + 3x \leq 0 \rightarrow x(x + 3) \leq 0$  $D_f = [-3, 0]$	۴
الف) $\log_{\frac{1}{3}} x^2 - 4$ $x^2 - 4 > 0$ $x^2 > 4$ $x > 2$ $x < -2$ $(-\infty, -2) \cup (2, +\infty)$	ب) $\log_{\frac{1}{3}} 2 - x$ $2 - x > 0 \rightarrow 2 > x$ $-2 < x < 2$ $(-2, 2)$	۵

الف) $y = \log \frac{x-1}{x+1}$ $x-1 > 0 \rightarrow x > 1$ $0-x > 0 \rightarrow x < 0$ $x \neq -1$  $D_f = (-\infty, 0) \cup (1, +\infty) - \{-1\}$	ب) $y = \log \frac{x^2-1}{x+1}$ $x+1 > 0 \rightarrow x > -1$ $x+1 \neq -1 \rightarrow x \neq -2$ $x^2-1 > 0 \rightarrow x^2 > 1$ $x > 1$ $x < -1$  $D_f = (-\infty, -1) \cup (1, +\infty) - \{-2\}$	6	
$y = \log \frac{x^2-x+1}{x-1}$ $\frac{x^2-x+1}{x-1} > 0 \rightarrow \frac{(x-1)(x-1)}{(x-1)} > 0$  $D_f = (1, +\infty) - \{1\}$	$y = \log \frac{x+1}{x-1}$ $x+1 > 0 \rightarrow x > -1$ $x+1 \neq -1 \rightarrow x \neq -2$ $\frac{x+1}{x-1} > 0$  $D_f = (-\infty, -1) \cup (1, +\infty) - \{-2\}$	7	
الف) $y = \sqrt{x \log(x-1)}$ $x-1 > 0 \rightarrow x > 1$ $x \log(x-1) \geq 0 \rightarrow x \geq \log(x-1)$ $\log(x-1) \leq x \rightarrow (x-1) \leq e^x \rightarrow x-1 \leq e$ $x \leq 1+e$  $D_f = (1, 1+e]$	ب) $y = \log(r \log x - 1)$ $x > 0$ $r \log x - 1 > 0 \rightarrow r \log x > 1 \rightarrow \log x > \frac{1}{r}$ $x > r^{\frac{1}{r}} \rightarrow x > \sqrt[r]{r}$  $D_f = (\sqrt[r]{r}, +\infty)$	8	
الف) $y = \frac{r}{x^2+1}$ $x^2+1 \neq 0 \rightarrow x^2 \neq -1$ غير ممكن $D_f = \mathbb{R}$	ب) $y = \frac{r}{x^2-1}$ $x^2-1 \neq 0 \rightarrow x^2 \neq 1 \rightarrow x \neq \pm 1$ $D_f = \mathbb{R} - \{1, -1\}$	ج) $y = \frac{r}{x^2-x}$ $x^2-x \neq 0 \rightarrow x^2 \neq x \rightarrow \log x^2 \neq \log x$ $D_f = \mathbb{R} - \{\log x\}$	9
د) $y = \frac{r}{x^2-x}$ $x^2-x \neq 0 \rightarrow x^2 \neq x$ $D_f = \mathbb{R} - \{\log x\}$	الف) $y = (x+1)!$ $x+1 \in \mathbb{N} \rightarrow x \in \mathbb{N} - 1 \rightarrow x \in \mathbb{N} - 1$ $\{x x = \frac{k-1}{r}, k \in \mathbb{N}\}$	10	
ب) $y = \left(\frac{r(x-1)}{x-1}\right)!$ $\frac{r(x-1)}{x-1} \in \mathbb{N} \rightarrow r(x-1) \in \mathbb{N} - 1$ $r(x-1) \in \mathbb{N} - 1$ $x(r-1) \in \mathbb{N} - 1$ $x \in \frac{\mathbb{N} - 1}{r-1}$ $\{x x = \frac{r-k}{r-1}, k \in \mathbb{N}\}$			