

الف $u(u-4) = \frac{u-4}{(u-1)(u+1)}$ $\frac{u-4}{(u-1)(u+1)} \geq 0$ $(-1, 0) \cup (0, 1) \cup [6, \infty)$	الف $\frac{u^3(u^2-1)}{u(u^2-1)} = u^2$ $u \neq -1, 0, 1$ $D = \mathbb{R} - \{-1, 0, 1\}$
الف $u + u > 0$ $u < 0$ $u \geq 0$ $D = (0, \infty)$	الف $y = \frac{1}{\sqrt{u} u }$ $u u > 0$ $D = (0, \infty)$
الف $y = \sqrt{4- u }$ $4- u \geq 0$ $[u] \leq 4 \Rightarrow u \leq 4$ $D = (-\infty, 4]$	الف $y = \frac{1}{\sqrt{4-[u]}}$ $4-[u] > 0$ $[u] < 4 \Rightarrow u < 4$ $D = (-\infty, 4)$
الف $\left[u + \frac{1}{u}\right] = \left[u - \frac{1}{u} + 1\right] = \left[u - \frac{1}{u}\right] + 1$ $\left[u - \frac{1}{u}\right] + 1 \geq 0$ $\left[u - \frac{1}{u}\right] \geq 0 \Rightarrow D = \left[\frac{1}{u}, \infty\right)$	الف $t = u - \frac{1}{u}$ $[t] + [-t]$ $u - \frac{1}{u} \in \mathbb{Z}$ $D = \left\{ \frac{1}{u} + u \mid u \in \mathbb{Z} \right\}$
الف $\sin u \neq 1$ $u \neq \frac{\pi}{2} + 2k\pi$ $D = \mathbb{R} - \left\{ \frac{\pi}{2} + 2k\pi \mid k \in \mathbb{Z} \right\}$	الف $y = \frac{1}{1 - \sin^2 u}$ $1 - \sin^2 u \neq 0$ $\sin^2 u \neq 1$ $u \neq \frac{\pi}{2} + \frac{k\pi}{2}$ $D = \mathbb{R} - \left\{ \frac{\pi}{2} + \frac{k\pi}{2} \mid k \in \mathbb{Z} \right\}$

$y = \sqrt{\sin x - 1}$ $\sqrt{\sin x - 1} \geq 0$ $\sin x \geq 1$ $D = \bigcup_{k \in \mathbb{Z}} \left[\frac{x}{5} + 2k\pi, \frac{5x}{6} + 2k\pi \right]$	حل $\cos x - 1 \geq 0$ $\cos x \geq 1$ $\cos x = 1$ $D = \{x \mid k\pi, k \in \mathbb{Z}\}$	6
$\cos y = a - 3$ $-1 \leq \cos y \leq 1$ $-1 \leq a - 3 \leq 1$ $2 \leq a \leq 4$ $D = [-4, -2] \cup [2, 4]$	حل $-1 \leq a^2 + 3a + 1 \leq 1$ $a^2 + 3a + 1 \geq 0 \Rightarrow (a+1)(a+2) \geq 0$ $a \leq -2 \text{ or } a \geq -1$ $a^2 + 3a \leq 0 \Rightarrow a(a+3) \leq 0$ $-3 \leq a \leq 0$ $D = [-3, -2] \cup [-1, 0]$	7
$a - 2 > 0 \Rightarrow a > 2$ $2 - \log_2(a-2) \geq 0$ $\log_2(a-2) \leq 2$ $a - 2 \leq 4$ $D = (2, 11]$	حل $y = \log(n^2 - n)$ $n^2 - n > 0$ $n(n-1)(n+1) > 0$ $D = (-1, 0) \cup (1, +\infty)$	8
$e^{n+1} \neq 0$ $D = \mathbb{R}$	حل $e^n - 1 \neq 0 \Rightarrow e^n \neq 1 \Rightarrow n \neq 0$ $D = \mathbb{R} - \{0\}$	9
$e^n \neq 2 \Rightarrow n \neq \log_e 2 = \frac{1}{e}$ $D = \mathbb{R} - \left\{ \frac{1}{e} \right\}$	حل $y = \frac{e^x}{e^x - 2}$ $D = \mathbb{R} - [\log_e 2]$ $e^n \neq 2 \Rightarrow n \neq \log_e 2$	10
$e^{n+1} = n$ و $n = 0, 1, 2, \dots$ حل $D = \left\{ \frac{n-1}{e} \mid n = 0, 1, 2, \dots \right\}$ $D = \left\{ -\frac{1}{e}, 0, \frac{1}{e}, \frac{2}{e}, \dots \right\}$	$\frac{e^{n+1} - 2}{e^{n+1} - 2} = n$ و $n = 1, 2, 3, \dots$ $e^{n+1} - 2 = e^n(n-2)$ $n(e^{n+1} - 2) = e^n(n-2)$ $n = \frac{e^n(n-2)}{e^{n+1} - 2}$ و $n = 0, 1, 2, \dots$ $D = \left\{ \frac{e^n(n-2)}{e^{n+1} - 2} \mid n = 0, 1, 2, \dots \right\}$	11