

$\log_{r^n-1} n \begin{cases} n > 0 \\ n \neq 1 \\ r^n - 1 > 0 \Rightarrow n > \frac{1}{r} \\ \log_{r^n-1} n \geq 0 \Rightarrow r^n - 1 \geq n \Rightarrow n \geq \frac{1}{r} \end{cases}$	(أ)	٦
$7 + \sqrt{ x } - x > 0 \Rightarrow (\sqrt{ x } = t) \Rightarrow -t^2 + t + 7 > 0 \quad \frac{-r \pm \sqrt{r^2 - 4ac}}{-2a}$ $-2 < t < 9 \quad \begin{cases} t > -2 \Rightarrow \sqrt{ x } > -2 \checkmark \\ t < 9 \Rightarrow \sqrt{ x } < 9 \Rightarrow x < 81 \Rightarrow -9 < x < 9 \end{cases}$	(ب)	٧
$\frac{r^n + r}{n + b} \Rightarrow \begin{cases} a = -r \\ b = -r \end{cases}$		٨
$[x] > x \Rightarrow x \geq 0 \quad [x] \leq x \Rightarrow x < 0$ $f(x) \geq x - 1 \Rightarrow r^n - 1 \geq x - 1 \quad (x \geq 0) \Rightarrow x \geq 0 \checkmark$ $f(x) \geq x - 1 \Rightarrow r^n + r \geq x - 1 \quad (x < 0) \Rightarrow r^n \geq -x \Rightarrow x \geq -\frac{x}{r}$ $D_f = [-\frac{x}{r}, +\infty)$		٩
$\frac{r(17n^5 + 17n^4 + 17n + 1)}{(4n + 1)^2} = \frac{r}{4n + 1} \quad D_{y, R} = \{-\frac{1}{r}\}$		١٠
$\log_{r^n-1} r^{n+a} \leq 1 \Rightarrow r^n - a \leq 1 \quad r^n \leq a + 1, \quad r^n - a > 0 \Rightarrow r^n > a$ $a < r^n \leq a + 1 \Rightarrow \frac{a}{r} < n \leq \frac{a+1}{r} \Rightarrow C-b: \frac{a+1-a}{r} = \frac{1}{r}$ $D_f = (\frac{a}{r}, \frac{a+1}{r}]$		١١