

$y = \sqrt{\log \frac{r^{n-1}}{n}}$ $r^{n-1} > 0$ $n > \frac{1}{r}$ $\log \frac{r^{n-1}}{n} > 0$ $D_f = \left(\frac{r}{n}, +\infty \right) - \{1\}$ $r^n > 1$ $n > \frac{1}{r}$ $r^{n-1} > 1$ $r^n > \frac{1}{r}$ $n > \frac{1}{r^2}$ $\neg) I(n) = \log \frac{1}{r + \sqrt{rn} - n }$ $y = (n) \sqrt{r + \sqrt{rn} - n } \geq \dots$	6
$g = \sqrt{\frac{r^{n-1} + an + ab}{n+b}} = \sqrt{\frac{(r+a)n + ab + r}{n+b}}$ $r+a=0$ $a=-r$ $\frac{-rb+r}{n+b} \geq 0$ $\frac{-rb+r}{n+b} \geq 0$ $b=-r$ $\frac{-rb+r}{n+b} \geq 0$	7
$I(n) \begin{cases} r^{n-1} & n \geq 0 \\ \{n+c\} & 0 < n \end{cases}$ $D_f = \left[-\frac{r}{n}, +\infty \right)$ $n \geq 0 \rightarrow y = \sqrt{n}$ $n < 0 \rightarrow y = \sqrt{n+c}$ $n \geq 0 \rightarrow y = \sqrt{n}$ $n < 0 \rightarrow y = \sqrt{n+c}$	8
$y = \frac{r^n + r^n n^2 + 11n + c}{(r^n + r^{n+1})^2} = \frac{r^n + r^n n^2 + 11n + c}{r^{2n+2} + r^{2n+1}} = \frac{r}{r^{n+1}}$ $r^{n+1} \neq 0 \Rightarrow n \neq -\frac{1}{r}$ $D_f = \mathbb{R} - \left\{ -\frac{1}{r} \right\}$	9
$y = \sqrt{1 - \log(rn-a)} \Rightarrow 1 - \log(rn-a) \geq 0$ $1 \geq \log(rn-a)$ $10 \geq rn-a$ $rn-a \geq 0$ $0 \leq rn-a \leq 10 \Rightarrow a \leq rn \leq 10+a \Rightarrow \frac{a}{r} \leq n \leq \frac{10+a}{r}$ $\frac{10+a}{r} - \frac{a}{r} = \boxed{10}$ $c-b$	10