Abstract: Let $M_n$ be the number of lattice paths in $\mathbb{Z}^2/n$ connecting the origin with $(1,a)$ (to within $1/n$ roundoff error at the end) that never cross above the barrier curve $y(x)$. If $y(0)=0$, $y(1)=a$, and $y$ is convex, then
\[
\lim_{n \to \infty} \frac{1}{n} \log M_n = \int_0^1 (1+y'(x)) H\left(\frac{1}{1+y'(x)}\right) \, dx,
\]
where $H(p) = -p \log p + (1-p) \log (1-p)$ is the usual entropy function; a slightly more complicated formula holds for non-convex barrier functions.