Scan AS36

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"Problem"

Manuscript

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Problem: continue the sequence 1, 2, 3, 8, 14, 42, 81...

Let a river comes from (o)SW, intersects the NE highway at n bridges and disappears at (o)NE if n is odd, at (o)SE if n is even. Find the number of possible configurations, a(n)::

\[
\begin{align*}
\text{N} & \quad \rightarrow a(1) = 1 \\
\text{S} & \quad \rightarrow a(2) = 1 \\
\text{E} & \quad \rightarrow a(3) = 2 \\
\text{W} & \quad \rightarrow a(4) = 3 \\
\end{align*}
\]

A lot of information on an is known, for instance (S. Lando)

\[a_n \text{ is odd } \iff N = 2^k\]

But we ignore the

\[\lim_{n \to \infty} \frac{\ln n}{n} = ?\]

\[a(5) = 8\]

(if it is easy to show that \(c4^n < a_n < C16^n\))

using Catalan numbers.