

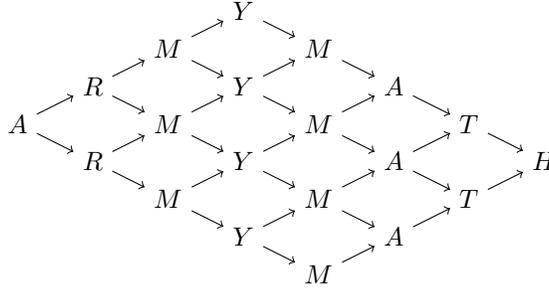
Problem 1: Lattice Paths

USMA D/Math Problem of the Week

Submission Deadline: September 20, 2007 at 1600

Circle one: cadet faculty non-usma student non-usma faculty other

Problem Statement: (a) How many ways can the words “ARMY MATH” be spelled out by following the arrows in the following diagram?



For full credit, use a method which generalizes to other phrases.

(b) Let $N(i)$ be the number of distinct paths from node 0 to node i in the following diagram:



For example, $N(3) = 3$. Show that $\frac{N(i+1)}{N(i)}$ converges as $i \rightarrow \infty$, and find the limit. If you want to go further, compute the exact value of $N(2007)$.

Submit your answer to Dr. Elisha Peterson at ae3263@usma.edu as an attachment to your email, with the subject line **WP POTW**.