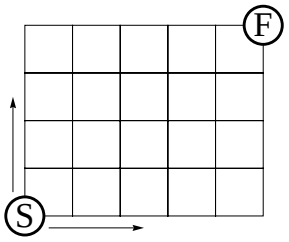
Bijection Practice

Goal: Determine a formula for the number of lattice paths from $(0, 0)$ to (m, n) which take only steps to the North or East. (See the figure at right.)



(a) Enumerate all N-E lattice paths from $(0, 0)$ to $(3, 2)$. (Draw them all.)

(b) Create a bijection between N-E lattice paths from $(0, 0)$ to (m, n) and words on the alphabet $\{N, E\}$ with n N-letters and m E-letters. Use this bijection to find a formula for the number of N-E lattice paths from $(0, 0)$ to (m, n).

(c) Use your formula from part (b) to determine the number of N-E lattice paths from $(0, 0)$ to $(10, 8)$ which do NOT pass through $(2, 5)$.