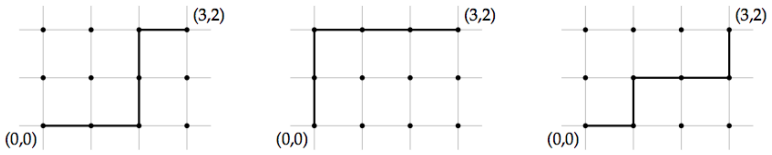
PROBLEM 1. In this problem we consider monotonic paths (those made from single right and single up steps) on the integer lattice starting from $(0,0)$.



Examples of monotonic paths from $(0,0)$ to $(3,2)$.

Suppose you want to take a monotonic path from $(0,0)$ to $(4,5)$ and then to $(8,20)$. How many different such paths can you take?

PROBLEM 2. How many five-card poker hands are there that are either a straight (five denominations in a row with no regard to suit) or a flush (all cards have the same suit)? An ace can count as either high or low in a straight, e.g., 10-J-Q-K-A or A-2-3-4-5, but a straight cannot wrap around, e.g., Q-K-A-2-3. (A formula from earlier homework for $|A \cup B|$ might be useful.)