# Unit 1 - Combinatorics - Basic Methods
# Week 2 - Combinatorial Proof

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Reading: AC 2.4, rest of chapter 2

## 1

AC 2.9.21:
Give a combinatorial proof that

$$\sum_{j=0}^{k} \binom{m}{j}\binom{w}{k-j} = \binom{m+w}{k}$$

## 2

AC 2.9.26:
How many lattice paths go from (0, 0) to (14, 73) which do not go through (6, 37)?

## 3

AC 2.9.32:
How many ways are there to color a set of 27 objects such that 7 are painted white, 6 are painted gold, 2 are painted blue, 7 are painted yellow, and 5 are painted green.