

*Proof.* By Theorem ??, an  $n$ -element set has  $2^n$  subsets. By definition,  $\binom{n}{k}$  is the number of  $k$ -element subsets. (One may say that we are using the sum rule here: the set of all subsets is a disjoint union of sets of  $k$ -element subsets over all  $k$  from 0 to  $n$ .) □