# Binomial Coefficients

CS/APMA 202

Rosen section 4.4

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# Binomial Coefficients

- It allows us to do a quick expansion of $(x+y)^n$

- Why it's really important:
- It provides a good context to present proofs
  - Especially combinatorial proofs

# Review: corollary 1 from section 4.3

- Let $n$ and $r$ be non-negative integers with $r \leq n$. Then $C(n,r) = C(n,n-r)$
- Or, $\binom{n}{r} = \binom{n}{n-r}$
- Proof (from last slide set):

$$C(n,r) = \frac{n!}{r!(n-r)!}$$

$$C(n,n-r) = \frac{n!}{(n-r)!\left[n-(n-r)\right]!} = \frac{n!}{r!(n-r)!}$$