CSC/MAT-220: Discrete Structures
EFY 6

Thomas R. Cameron

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Binomials

Prove the following Theorems.

Binomial Theorem: Let $n \in \mathbb{N}$ and x and y be variables. Then,

$$(x+y)^n = \sum_{k=0}^{n} \binom{n}{k} x^k y^{n-k}.$$

Hint: In a class of n students, each student is given the choice of solving either one of x different algebra problems or one of y different geometry problems. How many different outcomes are possible?

Binomial Formula: Let $0 \leq k \leq n$. Then,

$$n! = \binom{n}{k} k!(n-k)!$$

Hint: How many ways can the numbers 1 through n be arranged in a list?