Last name	
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## LARSON—MATH 550—CLASSROOM WORKSHEET 21 Pascal's Triangle & Binomial Coefficients.

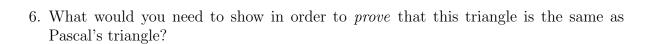
## Concepts & Notation

• Sec. 5.1. Binomial coefficients, Pascal's triangle.

We let  $\binom{n}{m}$  be the number of m-subsets of an n-set.

- 1. Find  $\binom{n}{1}$ .
- 2. Find  $\binom{n}{n-1}$ .
- 3. Find  $\binom{n}{0}$ ?
- 4. Find a formula for  $\binom{n}{m}$   $(0 \le m \le n, m, n \in \mathbb{Z})$ .

5. Draw 5 levels of a Pascal-style triangle where the  $0^{th}$  (top) level is the single number  $\binom{0}{0}$ , and where the  $n^{th}$  level is the (n+1) numbers  $\binom{n}{0}$ ,  $\binom{n}{1}$ , ...  $\binom{n}{n}$ .



7. Argue the symmetry identity 
$$\binom{n}{k} = \binom{n}{n-k}$$
.

8. Argue the absorbtion identity 
$$\binom{r}{k} = \frac{r}{k} \binom{r-1}{k-1}$$
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