Last name _____

First name _____

LARSON—MATH 350—CLASSROOM WORKSHEET 14
Pascal's Triangle!

Review

- What is the *Binomial Theorem*?
- What is *Pascal's Triangle*? Why does the i^{th} row sum to 2^i? Why are the "outside" terms all equal to 1? does does each "inside" term equal the sum of the two terms above it?

1. Draw 9 layers of Pascal's Triangle. Next to it, draw a second triangle with the values of the coefficients from Pascal's Triangle.

2. What formula did we conjecture for of the squares of the numbers in a layer of Pascal's triangle?

3. Can you prove it?

Fibonacci Numbers!

4. A staircase has 2 steps. You take 1 or 2 steps at a time. How many ways are there to go up the steps?

5. A staircase has 3 steps. You take 1 or 2 steps at a time. How many ways are there to go up the steps?

6. A staircase has 4 steps. You take 1 or 2 steps at a time. How many ways are there to go up the steps?

7. A staircase has n steps. You take 1 or 2 steps at a time. How many ways are there to go up the steps?

8. How is the *Fibonacci sequence* F_n ($n \geq 0$) defined?

9. Write out the terms F_0 through F_{10}.