MATH 174, LECTURE 17

1. Go over homework.

2. Homework: page 336, numbers 9, 10, 11, 13
   page 343, numbers 1, 2, 6, 7, 9, 13
   Quiz: Thursday (11/08) ← Change

Old

3. **Definition and Notation:** Let n and r be nonnegative integers with $r \leq n$. An *r-combination* of a set of n elements is a subset of r of the n elements. The symbol $\binom{n}{r}$ (read "n choose r") denotes the number of r-combinations that are possible to form from a given set of n elements.

4. **Theorem 6.4.1:** $\binom{n}{r} = \dfrac{n(n-1)\cdots(n-r+1)}{r!} = \dfrac{n!}{r!(n-r)!}$.

5. **FOIL method and beyond (and simpler).** Explain the binomial theorem.

6. **Some Identities**
$$\binom{n}{r} = \binom{n}{n-r} \qquad \text{and} \qquad \binom{n+1}{r} = \binom{n}{r} + \binom{n}{r-1}$$

7. **Pascal's triangle**

8. **Patterns**
   - symmetry
   - first and second element of a row
   - sum of a row

New

9. **Examples:** (1) If the 10^{th} row of Pascal's triangle is
$$1 \quad 12 \quad 55 \quad 170 \quad 322 \quad 374 \quad 322 \quad 170 \quad 55 \quad 12 \quad 1,$$
   what is the 11^{th} row?

   (2) page 326, number 19

   (3) page 343, number 4

   (4) page 343, number 8

   (5) page 343, number 10

   (6) page 343, number 14