

CSI 30 LECTURE NOTES (Ojakian)
Topic 17: Binomial Theorem and Pascal's Triangle

OUTLINE
(References: 6.4)

1. Binomial Theorem
 2. Pascal's Triangle
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1. Expanding Binomials

- (a) Recall "FOIL"
- (b) Example 1 (p. 437). $(x + y)^3 = \dots$
- (c) Theorem 1 (p. 437). Also state as: The coefficient of $x^{n-j}y^j$ is $C(n, j) = C(n, n-j)$
- (d) Examples 2, 3, 4.
Write out examples.

2. Pascal's Triangle

- (a) Build the triangle. Can see it on page 441.
- (b) Deeper understanding
 - i. $C(n, 0) = 1$ and $C(n, n) = 1$
 - ii. Pascal's Identity. Theorem 2 (page 440).
 - iii. Since Pascal's Identity matches the operation in Pascal's triangle, we can understand the triangle as displayed in Figure 1a (p. 441)

3. Exercises

Section 6.4: 1 - 9