

Fall 2015, Math 431: Week 3 Preliminary Problems
Due: Thursday, September 17th, 2015
Binomial Theorem and the Sieve Formula

Preliminary problems. The problems below should be completed before class on Thursday.

(P1) Differentiate the equality in the statement of the binomial theorem with respect to x .

(P2) Given the following information, use the Sieve formula to compute $|A_1 \cup A_2 \cup A_3 \cup A_4|$.

$$\begin{array}{llll} |A_1| = 15 & |A_1 \cap A_2| = 5 & |A_2 \cap A_4| = 5 & |A_1 \cap A_3 \cap A_4| = 1 \\ |A_2| = 10 & |A_1 \cap A_3| = 3 & |A_3 \cap A_4| = 1 & |A_2 \cap A_3 \cap A_4| = 1 \\ |A_3| = 6 & |A_1 \cap A_4| = 5 & |A_1 \cap A_2 \cap A_3| = 1 & |A_1 \cap A_2 \cap A_3 \cap A_4| = 1 \\ |A_4| = 5 & |A_2 \cap A_3| = 2 & |A_1 \cap A_2 \cap A_4| = 5 & \end{array}$$

$$|A_1 \cup A_2 \cup A_3 \cup A_4| =$$