MATH 74 HOMEWORK 3
DUE MONDAY, SEPTEMBER 15TH

(1) Do Eccles, 4.1, 4.2, 6.5.
(2) Let C be a set and let A and B be subsets of C. Prove *De Morgan's Laws*:
   (a) $C \setminus (A \cup B) = (C \setminus A) \cap (C \setminus B)$, and
   (b) $C \setminus (A \cap B) = (C \setminus A) \cup (C \setminus B)$.
(3) Write out the power sets of the sets $\emptyset, \{1\}, \{1,2\}$, and $\{1,2,3\}$. Make a conjecture of the form "If A is a finite set with n elements, then the power set of A is a set with __ elements." (Bonus: prove your conjecture.)
(4) Let $X = \{1,2\}$ and let $Y = \{2,3\}$. Compute the power set of $X \times Y$, the Cartesian product of X and Y.
(5) Let $X = \{1,2,3\}$ and $Y = \{1,2,3,4\}$. Count the number of functions from X to Y, preferably without actually writing them all down. (If I haven't defined "function" by the end of Friday's lecture, then don't do this problem).