INTRODUCTION TO ABSTRACT MATHEMATICS — ASSIGNMENT 6.2
FALL 2013 — DUE OCTOBER 11

Exercise 1. Prove that if A has n elements, then $\mathcal{P}(A)$ has 2^n elements.

Exercise 2. Let X be a set. Show that the union and intersection, as operations on $\mathcal{P}(X)$, are *not* cancellative. That is, show that the following two statements are *both false*.

a. For all $A, B, C \in \mathcal{P}(X)$, if $A \cup C = B \cup C$, then $A = B$.

b. For all $A, B, C \in \mathcal{P}(X)$, if $A \cap C = B \cap C$, then $A = B$.

Exercise 3. If A and B are sets, their *symmetric difference* is defined to be

$$A \Delta B = A \cup B - A \cap B.$$

Prove or disprove that $A\Delta(B\Delta C) = (A\Delta B)\Delta C$ for all sets A, B and C.