2018年8月16日 星期四

Discrete Math 2018

problem set 6

1. Let A and B be sets. Use rules to define set operations respectively for
   A. the union of A and B,
   B. the intersection of A and B,
   C. the set difference of A and B,
   D. the symmetric difference of A and B.
2. Let $x_0 = \{\emptyset\}$ denote a set. Consider construction of following sets. If we relate $\emptyset$ to 0 and $x_0, x_1, x_2, \ldots$ to 1,2,…, we have natural numbers.

   A. Let $x_1 = x_0 \cup \{x_0\}$. $x_1 = ?$

   B. Let $x_2 = x_1 \cup \{x_1\}$. $x_2 = ?$

   C. Let $x_3 = x_2 \cup \{x_2\}$. $x_3 = ?$

   D. $x_4 \cup x_2$=?

   E. $x_4 \cap x_2$=?

   F. $x_4 \backslash x_2 = ?$

   G. $x_4 \triangle x_2 = ?$

   H. Is $x_2 \in x_3$? Explain why.

   I. Is $x_2 \subseteq x_3$? Explain why.

2. Let my_package = {{my_lunch}, my_textbook, my_slingshot}. Is my_lunch ∈ my_package? Is my_lunch ⊆ my_package ?
3. Use rules to generate the following sets.
   A. the even numbers
   B. the odd numbers
   C. the prime numbers
4. Prove that the following statements hold for all sets S and T.

   A. $S \subseteq S \cup T$

   B. $S = (S \cap T) \cup (S \backslash T)$