

## Math 220 – Homework 6

Due Thursday 03/09 at the beginning of class

Total points=96

### PART A

Problems from the textbook:

**Section 2.1** # 1(b, c, e, i) 12pts; 2(b, f, h) 9pts; 4(b, c, f, i) 16pts; 5 (a)4pts; (b) 5pts; 14 (a)3pts;(b) 5pts; (c)5pts; 15 10pts;

### PART B

1. 12pts Determine the truth or falsehood of the following statements. (Write TRUE or FALSE for each statement.)
  - (a) The contrapositive of the statement
 

*“If all elements of  $A$  are elements of  $B$ , then  $A$  is a subset of  $B$ ”*

 is the statement
 

*“If  $A$  is a subset of  $B$ , then all elements of  $A$  are elements of  $B$ ”*.
  - (b)  $\{a, b\} = \{b, a, b\}$
  - (c) If  $A = \{m \in \mathbb{Z} \mid 2 < m \leq 5\}$  then  $|A| = 4$ .
  - (d) The empty set is a subset of every set except itself.
  - (e)  $7 \notin \{\{-1, 7\}, \{-7, 2017, 0\}, \{1, 2\}\}$ .
  - (f) If  $A = \{a, \{a, b, c\}\}$  and  $B = \{\{c, d\}, \{a, b, c, d\}\}$  then  $|A| = |B|$ .
2. 15pts Let  $A, B$ , and  $C$  be nonempty subsets of a universal set  $U$ . Disprove the following statements:
  - (a) If  $A \cap B = A \cap C$ , then  $B = C$ .
  - (b) If  $A - B = C - B$ , then implies  $A = C$ .
  - (c) If  $A$  is not a subset of  $B$  and  $B$  is not a subset of  $A$ , then  $A \cap B = \emptyset$ .