

CS 313k - homework 4

Staple the pages of your solution set together, and put your name and EID on the top of the first page. Answer each question clearly. The logic you use to produce your answers is the most important thing.

1. section 1.4 (p. 42), 6
2. section 3.3 (p. 122), 6
3. section 3.3 (p.123), 21
4. Prove that if $A \subseteq B$ and $A \subseteq C$ then $A \subseteq B \cap C$.
5. Prove that if $A \subseteq B$, then $C - B \subseteq C - A$ for every set C .
6. Prove that for every integer x , $x^2 + x$ is even.
7. section 3.6 (p. 153), 2
8. For any sets A, B and C , prove that:
 - (a) $(A - B) - C \subseteq A - C$.
 - (b) $A \cap (B - A) = \emptyset$.
9. Draw Venn diagrams for the following:
 - (a) $A \cap (B \cup C)$
 - (b) $A^c \cap B^c \cap C^c$
 - (c) $(A - B) \cup (A - C) \cup (B - C)$
10. Let $A = \{a, b, c, d\}$, $B = \{b, f\}$, $C = \{f, a, k, h\}$. Define the following sets.
 - (a) $A - B$
 - (b) $B - A$
 - (c) 2^B
 - (d) $A \cap C$
 - (e) $A \cap C^c$, where $U = \{a, b, c, \dots, z\}$.