

HOMEWORK 1
STA5724.01, Probability
Fall Semester, 2007

Due: Friday, , 2008

- 1 For events A, B such that $A \subset B$, show that

$$B^c \subset A^c.$$

- 2 For every two events A and B , show that

$$(A \cup B)^c = A^c \cap B^c$$

and

$$(A \cap B)^c = A^c \cup B^c.$$

- 3 For every three events A, B, C , show that

$$A - (B \cup C) = (A - B) \cap (A - C)$$

and

$$A - (B \cap C) = (A - B) \cup (A - C)$$

- 4 For every two events A and B , show that AB and AB^c are disjoint and also prove that

$$A = (AB) \cup (AB^c).$$

In addition show that AB, AB^c , and A^cB are disjoint.

- 5 For every collection of events A_i for $i \in I$ (I is an index set), show that

$$(\cup_{i \in I} A_i)^c = \cap_{i \in I} A_i^c$$

and

$$(\cap_{i \in I} A_i)^c = \cup_{i \in I} A_i^c$$