STAT 441 - Mathematical Statistics I
Due: Wednesday (at the start of class), Sept. 13, 2017

Instructions: *Include all relevant work to get full credit.*

Homework 2

1. A sample space consists of only 5 different outcomes (or simple events), E_1, E_2, E_3, E_4, and E_5. If $P(E_1) = P(E_2) = 0.12, P(E_3) = .37$, and $P(E_4) = 2P(E_5)$, find the probability of E_4 and E_5.

2. Suppose $P(A) = 0.35, P(B) = .4$, and $P(A \cap B) = .3$.

a. Find $P(A^c)$.

b. Find $P(A \cup B)$.

c. Find $P(A|B)$.

d. Find $P(A^c|B)$.

e. Find $P(A^c|B^c)$.

f. Are events A and B mutually exclusive? Explain why.

g. Are events A and B independent? Justify your answer.

3. Prove that $P(A|B) + P(A^c|B) = 1$.