Name and NetID:

Question 1. Three cards are drawn from a deck having three suits: red, green, and blue. Let $\mathcal{S}$ be the sample space of the suits of all drawn hands of three cards, A be the event where the final card is green, and B be the event where the first card is red.

1. Calculate, providing reasoning, the size of $\mathcal{S}$. *[3]*

2. List the elements of $A \cap B$ and the elements of $(A \cap B)^c$. *[3]*

Question 2. The Texas A&M Student Body Senate is electing committee members from a pool of twelve candidates, intending to choose five persons. Three candidates come from the College of Science, three from the College of Medicine, four from the College of Education, and two from the College of Engineering. Determine the total number of distinct committees possible, given that at least one person must be chosen from each College. *[4]*

Bonus Question.

1. Consider subsets A and B of a universal set U. Describe in your own words the sets $A^c \cup B^c$ and $(A \cup B)^c$. $\qquad$ *[2]*

2. Consider subsets A, B and C of a universal set U, satisfying $n(A^c \cup B \cup C^c) = 27$ and $n(U) = 40$. Explicitly use De Morgan's laws to compute $n(A \cap B^c \cap C)$. *[2]*