Name and NetID:

Question 1. Let A_1, A_2 and A_3 be mutually exclusive and exhaustive events of some sample space $\mathcal{S}$, where $\mathbb{P}(A_1) = \mathbb{P}(A_2) = 0.3$. Suppose that one out of ten of A_1 observations support Darwin's Theory of Evolution, one out of two of A_2 observations support Darwin's Theory of Evolution, and two out of five of A_3 observations support Darwin's Theory of Evolution. Given that a certain observation does not support Darwin's Theory of Evolution, calculate the probability that it is classified in A_3.   **[5]**

Question 2. The probability of a Texas A&M student of going to a football game depends on how long they have been at the University and what is their favorite color. Let F represent a freshman, S a sophomore, and J a junior, while M if their favorite color is maroon. The probabilities are:

$$\mathbb{P}(F) = 0.42, \quad \mathbb{P}(S) = 0.21, \quad \mathrm{P}(J) = 0.12, \quad \mathbb{P}(M) = 0.25.$$

1. Given that $\mathbb{P}(S \cap M) = 0.11$, calculate the probability that a student going to a game has maroon as their favorite color given it is a sophomore.   **[3]**

2. Assuming that having maroon as a favorite color is independent of how long a student has been at the University, calculate the probability that a student going to a game has maroon as their favorite color given it is a sophomore.   **[2]**

Bonus Question. Let $S = \{0, 1, 2, 4, 5, 6, 7, 8\}$ be a uniform sample space. Determine the probability that a chosen number is greater than 5 given that it is even. *[4]*