Homework 2

2.3.2. Let $A$ and $B$ be any two events defined on $S$. Suppose that $P(A) = 0.4$, $P(B) = 0.5$, and $P(A \cap B) = 0.1$. What is the probability that $A$ or $B$ but not both occur?

2.3.3. Express the following probabilities in term of $P(A), P(B)$, and $P(A \cap B)$.

a) $P(A^C \cup B^C)$

b) $P(A^C \cap (A \cup B))$

2.3.10. An urn contains twenty-four chips, numbered 1 through 24. One is drawn at random. Let $A$ be the event that the number is divisible by two and let $B$ be the event that the number is divisible by three. Find $P(A \cup B)$.

2.3.11. If State’s football team has a 10% chance of winning Saturday’s game, a 30% chance of winning two weeks from now, and a 65% chance of losing both games, what are their chances of winning exactly once?

2.3.12. Events $A_1$ and $A_2$ are such that $A_1 \cup A_2 = S$ and $A_1 \cap A_2 = 0$. Find $p_2$ if $P(A_1) = p_1, P(A_2) = p_2$, and $3p_1 - p_2 = \frac{1}{2}$.

2.3.16. Two dice are tossed. Assume that each possible outcome has a $1/36$ probability. Let $A$ be the event that the sum of faces showing is 6, and let $B$ be the event that the face showing on one die is twice the face showing on the other. Calculate $P(A \cap B^C)$. 