1. Two dice are rolled. Let $E$ be the event "at lease one die is a 4" and let $F$ denote the event "the sum of the dice is 9."

   (a) Are the events $E$ and $F$ mutually exclusive? Explain. *(2 points)*

   (b) Find $P(E)$ and $P(F)$. *(6 points)*

2. If $E$ and $F$ are two events in a sample space with $P(E) = 0.36$, $P(E \cup F) = 0.68$, and $P(E \cap F) = 0.21$, find the value of $P(F)$. Show your work. *(5 points)*

3. If three dice are rolled, find the probability that at least two of the dice match. Explain your work. *(7 points)*