Discussion 9

1. Let $X$ be the number appearing on the first die when two fair dice are rolled and let $Y$ be the sum of the numbers appearing on the two dice. Show that $E(X)E(Y) \neq E(XY)$.

2. Let $X$ be a random variable on a sample space $S$. Show that $V(aX + b) = a^2V(X)$ whenever $a$ and $b$ are real numbers.
3. When a test for steroids is given to soccer players, 98% of the players taking steroids test positive and 12% of the players not taking steroids test positive. Suppose that 5% of soccer players take steroids. What is the probability that a soccer player who tests positive takes steroids?