5. Alice flips a fair coin n times and Bob flips another fair coin $n+1$ times, resulting in independent $X \sim \text{Bin}(n, \frac{1}{2})$ and $Y \sim \text{Bin}(n+1, \frac{1}{2})$.

(a) Let $V = \min(X, Y)$ be the smaller of X and Y, and let $W = \max(X, Y)$ be the larger of X and Y. (If $X = Y$, then $V = W = X = Y$.) Find $E(V) + E(W)$ in terms of n (simplify).

(b) Is it true that $P(X < Y) = P(n - X < n + 1 - Y)$? Explain why or why not.

(c) Compute $P(X < Y)$ (simplify). Hint: use (b) and that X and Y are integers.