MSO205A PRACTICE PROBLEMS SET 3

Question 1. Fix $p \in (0, 1)$. Suppose we have a coin such that tossing it results in a head with probability p and a tail with probability $1 - p$. The coin is tossed twice independently and the number X of heads is observed. Compute $\mathbb{P}(X^{-1}(A))$ for all subsets A of $\mathbb{R}$.

Question 2. Suppose that an event A is independent of itself. What can you say about $\mathbb{P}(A)$?