



and  $X_2$  be the events of the 1st and 2nd flips showing heads, respectively. Are  $X_1$  and  $X_2$  independent? Please prove your answer.

(b) Mario randomly picks a single coin and flips it twice. Let  $Y_1$  and  $Y_2$  be the events of the 1st and 2nd flips showing heads, respectively. Are  $Y_1$  and  $Y_2$  independent? Please prove your answer.

(c) Mario arranges his three coins in a row. He flips the coin on the left, which shows heads. He then flips the coin in the middle, which shows heads. Finally, he flips the coin on the right. What is the probability that it also shows heads?

