

1) If we select a card at random from the standard deck of 52 cards, let A be the event that a face-card is drawn (i.e., a Jack, or Queen or King is drawn). Let B be the event that the drawn card is a club. Show that A and B are independent events.

2) If  $P(\{H\}) = p$  and we keep tossing the coin until we see the first head, then find the probability of {13 T's before the first H}.

3) If two events with positive probabilities are disjoint, can they be independent? Justify your answer.

4) Show that if A, B are independent events then so are A, B'.

5) A fair coin is tossed and then a biased coin, whose probability of heads is 0.6, is tossed. Find the probability that at least one head will occur.

6) We toss a coin n times, where the probability of a head on a single toss is p. Compute the probability of the event that the n tosses will produce both heads and tails. Is this a binomial experiment, a geometric experiment or a negative binomial experiment?

7) For a geometric experiment what is the chance that it will take even number of tails before observing the first head?