1. Consider hands of size 1, 5, 10 and 13 and a deck of 52 cards. You should have 4 answers for each question.

(a) How many different hands are possible?
(b) How many different hands of all hearts are possible?
(c) What is the probability of getting all hearts?
(d) What is the probability of getting all face cards (J,Q or K)?
(e) What is the probability of getting all hearts or all face cards?

2. Given that I have only face cards in my hand of 5 cards, what is the probability that one selected at random is a heart?

3. Show that the events, “draw a heart” and the event “draw a face card” are independent.

4. Consider a fair 6-sided die with the numbers 1,2,2,3,3,3 on it.

(a) Out of 5 rolls, what is the probability of exactly 3 occurrences for each number?
(b) Out of 6 rolls, what is the probability of at least 3 occurrences for each number?
(c) Out of 7 rolls, what is the probability of less than 3 occurrences for each number?