(1) Assume you are dealt a six-card hand. Show your work.
   (a) What is the probability of being dealt a four-of-a-kind and a pair?
   (b) What is the probability of being dealt two three-of-a-kinds?
   (c) What is the probability of being dealt three pairs?
   (d) What is the probability of being dealt two pairs?

(2) Assume you are dealt a thirteen-card bridge hand. Show your work.
   (a) What is the probability of being dealt exactly five spades, three hearts,
       three diamonds, and two clubs?
   (b) What is the probability of being dealt some 5-3-3-2 hand?

(3) Consider the following layout of some suit in your two hands, playing in notrump.
    \[ \text{a}q53 \]
    \[ \text{k62} \]
    How should you play the suit? What is your probability of winning four tricks
    in the suit?

(4) Consider the following layout of some suit in your two hands, playing in notrump.
    \[ \text{a}j53 \]
    \[ \text{k62} \]
    (a) Assume your goal is to take four tricks in the suit. How should you play
        the suit? What is your probability of success?
    (b) Assume your goal is only to take at least three tricks in the suit. How
        should you play the suit? What is your probability of success?

(5) Show that the first player always wins “bowling alone” with optimal play, no
    matter how many bowling pins the game starts with.