This activity is worth 20 points of course credit. See tentative calendar for due dates. Late activities are accepted at the discretion of your recitation instructor and a penalty may be imposed.

(1) (5 pts) There are nine competitors in an Olympic ski trial from which the top three finishers advance. Of the nine, exactly 3 come from the USA. In how many (unordered) ways could at least two of the advancing competitors be from the USA? More importantly, describe your method using complete and grammatically correct sentences.
Consider the equation $x_1 + x_2 + \cdots + x_t = n$ where $n \in \mathbb{N}$.

(a) (3 pts) Using complete and grammatically correct sentences, describe a method for determining the number of solutions to the equation where $x_i$ is a non-negative integer for $i = 1, 2, ..., t$.

(b) (3 pts) Using complete and grammatically correct sentences, describe a method for determining the number of solutions to the equation where $x_i$ is a positive integer for $i = 1, 2, ..., t$.

(c) (3 pts) Using complete and grammatically correct sentences, describe a method for determining the number of solutions to the equation where $x_i$ is at least 10 for $i = 1, 2, ..., t$. Here we assume that $n > 10t - 1$. 

(3) A standard deck of cards has 52 cards, coming in four suits (hearts and diamonds are red suits while spades and clubs are black suits) and thirteen kinds (an ace, two, ..., ten, jack, queen and king in each suit).

(a) (3 pts) Using complete and grammatically correct sentences, describe a method for determining the number of randomly dealt five-card hands that produce three of one kind and two of another kind (a full-house).

(b) (3 pts) Using complete and grammatically correct sentences, describe a method for determining the number of randomly dealt five-card hands that produce exactly two of one kind and exactly two of another kind.