MATH 113: DISCRETE STRUCTURES
MONDAY WEEK 5 HANDOUT

Problem 1. At a large university, 1232 students have taken a course in Spanish, 879 have taken a course in Friench, and 114 have taken a course in Russian. Further, 103 have taken a course in both Spanish and French, 23 have taken a course in both Spanish and Russian, and 14 have taken courses in both French and Russian. If 2092 students have taken at least one of Spanish, French, and Russian, how many students have taken a course in all three languages?

Problem 2. How many poker hands (5 cards) from a regular deck (52 cards) have at least one card from each of the four standard suits? *Hint*: Let $N_\spadesuit$ be the collection of hands containing no spades, and similarly define $N_\clubsuit$, $N_\heartsuit$, and $N_\diamondsuit$. What is the relationship between the answer to this question and $|N_\spadesuit \cup N_\clubsuit \cup N_\heartsuit \cup N_\diamondsuit|$?