Quantitative Reasoning 28:
The Magic of Numbers

Homework 8

Assigned on Friday October 5th
Due at 12 noon Wednesday October 10th

Please submit problem sets at the end of the relevant lecture, or leave in the box labeled QR28 outside the Math Department's main office, on the third floor of the Science Center (Room 325).

Reading:

Gross-Harris, Chapter 6,7

Problems:

Please explain your reasoning and show your work.

1. (a) Express $\binom{7}{4} + \binom{7}{5}$ as a single binomial coefficient.

   (b) Express $\binom{9}{4} + \binom{9}{3} + \binom{10}{3}$ as a single binomial coefficient.

2. There is life on Mars! Unfortunately, a flood is on its way. Noahzoid is eager to load up animals onto his boat. There are sheepoids, chickenoids, and zebrazoids. Each of them can reproduce asexually, but they will be even more fruitful when mating in pairs, triples, quadruples, &c., so it makes sense to load any number of them onto the boat (and maybe some won't be saved at all). If there is room for 10 animals on the boat (and there are at least 10 of each animal from which to choose), how many different combinations of sheepoids, chickenoids, and zebrazoids could be chosen by Noahzoid?