

Finite Math, Math 220, Summer 2006

Friday Group Work

Assigned: Friday, July 21, 2006
Due: Tuesday, July 25, 2006

1 Forming a Chaired Committee

How many ways can we create a committee (of any size) from a class of n students, where one of the committee members is designated as the chair of the committee? Find two different counting arguments that answer this question and use them to justify the identity:

$$0 \cdot \binom{n}{0} + 1 \cdot \binom{n}{1} + 2 \cdot \binom{n}{2} + \dots + n \cdot \binom{n}{n} = n \cdot 2^{n-1}$$

2 Arranging Parade Floats

You are in charge of lining up 20 parade floats for the big Mardi Gras parade in St Louis. You can arrange the floats in any order you like with the only condition being that the floats for Johnny's Pizza and Julie's Deli can't be next to each other (i.e. there must be at least one other float between them). Johnny and Julie really don't like each other. How many possible arrangements of the 20 floats are there?

3 Going to the Buffet

You are responsible for sending guests of a wedding reception to the buffet line. From a round table of 16 guests, you are to pick a set of 3 lucky people to head to the buffet first. The only condition is that no 2 of the 3 people can be sitting next to each other. How many different ways are there to choose the 3 people. Remember, the ordering of the 3 people matters since being picked first to go to the buffet is certainly better than being picked second or third.