



Wednesday, September 23, 2009
4:00–4:50 p.m.
SAS 2229

Cayley's formula

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Say you have n computers (labeled $1, 2, \dots, n$), and you start connecting pairs of computers with wires. The computers can relay messages, so, for example, if 1 is connected to 4 and 4 is connected to 7, then 1 and 7 can communicate. This network of computers is an example of a **graph**: the computers are vertices and the wires are edges. If we connect all computers together with the smallest possible number of wires ($n - 1$), the graph is called a **tree**. Cayley's formula tells us that there are n^{n-2} ways there are to connect the n computers with only $n - 1$ wires. I'll explain this surprisingly simple formula, and discuss the connection to the symmetric group of permutations. No prior knowledge of graphs, trees, the symmetric group, or permutations will be assumed. The talk will be **accessible to all undergraduates**.

NCSU Society for Undergraduate Mathematics

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