MANY CHEERFUL FACTS

presents

Buy One Tree, Get Exactly Six Free

a talk by Richard Dore

13:10 – 14:00 on Thursday, November 8, in room 1015.

One can demonstrate a bijection between binary trees and seven-tuples of binary trees which is surprisingly "elementary". Here elementary means that the bijection only has to look down a fixed depth, and then just copies entire subtrees. There is something special about seven — it is provably impossible when seven is replaced by something which is not congruent to one modulo six. In this talk, I will demonstrate this bijection. Then I will try to convince you that seven is special by talking about things like sixth roots of unity and a certain quotient of a certain semiring. I will then prove a more general theorem about when elementary bijections are possible or impossible. Time permitting, I might even say something about intuitionism.

I am the very model of a modern Major General,
I've information vegetable, animal, and mineral,
I know the kings of England, and I quote the fights historical
From Marathon to Waterloo, in order categorical;
I'm very well acquainted, too, with matters mathematical,
I understand equations, both the simple and quadratical,
About binomial theorem I'm teeming with a lot o' news,
With many cheerful facts about the square of the hypotenuse!

— Gilbert & Sullivan, $P \circ P$

The website for Many Cheerful Facts is
http://www.math.berkeley.edu/∼mcf