Michigan Math Club

Thursday at 4pm in the Commons
Free Pizza and Pop

Generating Functions

Julian Rosen

Suppose that, in some country, the coins come in denominations of one, two, and three cents. In how many ways can a person pay for an item that costs n cents? If we let a_n denote the number of combinations of coins whose value is n, then we would like to have a formula for a_n. When trying to find a formula for a sequence of numbers, it can be helpful to consider the Taylor series whose coefficients are the terms in the sequence. The function defined by this Taylor series is called the generating function for the sequence. In many cases, computing the generating function for a sequence is the best way to compute what the n-th term is. In this talk, we will see several examples where this is the case.