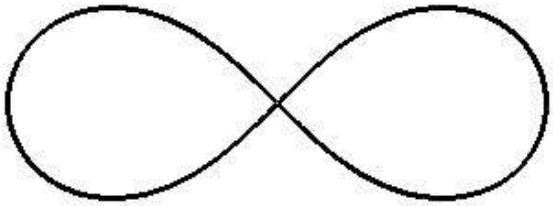
Undergraduate Math Club
Winter 2007
2nd floor Nesbitt Common Room
Thursday, January 25, 4:10-5:00pm
(free pizza and pop, as always)



The Arithmetic Geometric Mean (AGM)

Professor Tamar Ziegler

Abstract

The arithmetic geometric mean $M(a,b)$ of two numbers a and b is defined to be the common limit of the two sequences $\{a_n\}$ and $\{b_n\}$ determined by the algorithm $a_0 = a$, $b_0 = b$, $a_{n+1} = (a_n + b_n)/2$, and $b_{n+1} = (a_n b_n)^{1/2}$ for $n = 0,1,2, \ldots$ This mean is related to fast calculation of elliptic integrals and serves as a tool in computational number theory. We will review some elementary properties of this mean and describe the connection (discovered by Gauss) between $M(2^{1/2},1)$ and the length of the lemniscate.