

**Undergraduate Math Club**

**Fall 2007**

**2<sup>nd</sup> floor Nesbitt Common Room**

**October 11, 4:10-5:00pm**

**(free pizza and pop, as always)**

# **Cake sharing and square tiling of rectangles**

**Professor Hyman Bass**

## **Abstract**

If  $s$  students want to share  $c$  cakes equally, what is the least number of cake pieces needed to make this equal distribution? We present two methods to produce such minimal distributions, one based on the Euclidean algorithm. The proof of minimality makes use of some elementary graph theory. The Euclidean algorithm can be interpreted as a greedy algorithm for tiling of a rectangle by squares. It is not optimal in general for producing tilings with the smallest number of squares, but it can be shown to minimize the "complete perimeter" of the tiling.