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**Homeira Pajooresh** and **T. Bruce McLean\*** (bmclean@georgiasouthern.edu), 19 Northlake Dr., Statesboro, GA 30458, and **Thomas Anderson, Chasen Smith, Emil Iacob** and **John Nelson**. *Counting the Mathematical Faces of All Regular Flexagons*. Preliminary report.

Three faculty joined with three students over the last two years to study regular flexagons. Regular flexagons are constructed from straight strips of paper consisting of equilateral triangles and were discovered in 1939 by Arthur Stone when he was a graduate student at Princeton University. It is well known that a regular flexagon of order  $3n$ ,  $n > 0$ , contains  $9n$  equilateral triangles, and is a mobius band with  $3(3n - 2)$  half-twists. If only the pinch flex is used it is also known that there are  $6n - 3$  different mathematical faces. In 1979, with the discovery of the V-flex, the flexagon of order 6 was shown to have 3420 mathematical faces. It is the purpose of this paper to demonstrate an algebraic algorithm that counts the number of mathematical faces for flexagons of order  $3n$  for every natural number  $n$ . (Received September 01, 2008)