

1108-05-387

Shamil Shakirov* (shakirov@berkeley.edu), 1605 Milvia St Apt C, Berkeley CA, 94709,
Berkeley, CA 94709. *Graphs on surfaces, Toda equations, and the Arctangent.*

Generating functions for combinatorial data often satisfy interesting non-linear differential equations. Counting graphs on two-dimensional surfaces, for example, gives rise to the Toda equations. The classical result of Harer and Zagier is that the solution to these equations for the case of 1-face graphs is an explicit rational function. We generalize this result to 1,2, and 3-face graphs. While the corresponding generating functions are no longer rational, they are elementary, expressible through the arctangent function. The question if the 4-face and higher generating functions are elementary too, remains open. (Received January 19, 2015)