

1070-14-59

Kenneth B Ascher* (kennyascher@gmail.com), SUNY Stony Brook, Department of Mathematics, 100 Nicolls Road, Stony Brook, NY 11794. *Random Trinomials & Lower Binomials*.

There is no general formula, using rational functions and radicals, to determine real roots of polynomials of degree 5 or more. We show how to compute the number of real, non-zero roots of trinomials (of arbitrary degree) using a simple logarithmic inequality. Using the log-uniform distribution for the coefficients, we prove that the number of real roots is $\frac{3}{2}$ on average. We then present generalizations of this result to polynomials with an arbitrary number of terms (t -nomial). Finally, we show how an "Archimedian" Newton Polygon gives an algorithm to efficiently approximate the roots of f . This work was conducted under Profesor J. Maurice Rojas as part of the 2010 Math REU at Texas A&M University. (Received January 20, 2011)