1067-05-1750 **L. Marie Chism*** (lmchism3@hotmail.com). *On Independence Polynomials and Independence Equivalence in Graphs.*

Informally, a graph is a collection of vertices, some pairs of which are joined by edges. An independent set in a graph is a collection of vertices no two of which are joined by an edge. If G is a graph and $k > 0$ is an integer, then I denote by "$f_k(G)$" the number of k-vertex independent sets in G. The independence polynomial of G is $f_G(x) = \sum f_k(G)x^k$, where $f_G(x)$ is the generating function for the numbers $\{f_k(G)\}$. Most of the previous results are inequalities and asymptotic estimates, but exact formulas have been found for only a few classes of graphs such as paths, cycles, and $2 \times n$ lattices. I have studied the independence polynomial for some classes of graphs and found exact formulas in several cases. Among my results are closed formulas for $2 \times n$ lattices, Möbius ladders, and combs. For each of these classes of graphs, I generate a combinatorial identity. I have also considered "matching polynomials," that is, independence polynomials of line graphs, and derived a closed expression for the matching polynomials of some generalized combs. I last have investigated "independence equivalence," the phenomenon of non-isomorphic graphs having identical polynomials finding several infinite classes of such pairs of graphs. (Received September 21, 2010)