1011-06-102 **Joel Berman*** (jberman@uic.edu), Department of Mathematics, University of Illinois at Chicago, 851 S. Morgan Street, Chicago, IL 60607-7045. *Numerical invariants for varieties of algebras.* Preliminary report.

For a variety \mathcal{V} of algebras let $\mathbf{F}_{\mathcal{V}}(n)$ be the free algebra for \mathcal{V} on n free generators, let f(n) denote the cardinality of $\mathbf{F}_{\mathcal{V}}(n)$ and let c(n) be the cardinality of the congruence lattice of $\mathbf{F}_{\mathcal{V}}(n)$. The number of at most n-generated algebras in \mathcal{V} , up to isomorphism, is denoted by g(n). In this talk we investigate the relationships between these functions in the case that \mathcal{V} is locally finite. Of particular concern is how close these three functions are to one another in the exponential hierarchy. Some sample results include: If f(n) is an at least m-fold exponential function of n, then so is c(n). If \mathcal{V} is a congruence distributive variety and f(n) is at least m-fold exponential as a function of n, then g(n) is at least (m-1)-fold exponential. Other results and open problems in this vein will be presented. (Received August 18, 2005)