1086-03-1037 **Julia F. Knight*** (knight.1@nd.edu). *Uses of index set calculations.*

For a computable structure $\mathcal{A}$, the *index set*, $I(\mathcal{A})$, is the set of indices for computable copies of $\mathcal{A}$. For certain questions, not directly about index sets, we obtain answers using index set calculations. I will give examples of two different kinds.

1. Various familiar kinds of groups have simple descriptions. Index set calculations give us a way to test that a description is optimal. This is illustrated in known results on Abelian p-groups and free groups and in new work (joint with Vikram Saraph, an undergraduate) on torsion-free Abelian groups.

2. "Turing computable embeddings" (developed with graduate and undergraduate students) give an effective reduction of the isomorphism problem for one class of countable structures to that of another class. Many non-embeddability results reflect differences in the complexity of the sentences needed to distinguish among members of the two classes. Some new results, discovered jointly with a large group, involve model theoretic differences similar to Morley degree. The proofs of these results involve index set calculations.

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