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John Rhodes*, rhodes@math.berkeley.edu, and **Edmond Lee**, elee1@nova.edu. *A survey of finite join irreducible (ji) semigroups.*

A survey of finite join irreducible (ji) semigroups in which all semigroups considered are finite. Direct product is denoted \times and division $S < T$ means S is a surmorphism of a subsemigroup of T . S is ji if $S < A \times B$ implies there exist an n so S divides an n th power of A or an n power of B , where n th power means direct product n times. Equivalently, S is ji if the pseudovariety (S) generated by S is ji in the complete lattice of all pseudovarieties of finite semigroups.

We will probably never know all the ji semigroups. We do not know if S being ji is decidable. In this talk we give a survey of all known ji semigroups to date, including some infinite families. We define 4 operations on finite semigroups that preserve ji. We know all the ji semigroups of order 5 or less, using the aid of known computer-generated tables, known results and some new results. We present some conjectures.

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