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Robert J Sacker* (rsacker@usc.edu), Mathematics Dept., University of Southern California, 3620 S. Vermont Ave., KAP 108, Los Angeles, CA 90089-2532. *Semigroups of Maps and Periodic Difference Equations.*

A collection \mathcal{M} of monotonic maps from the positive reals to the positive reals is defined. Each map is linearly bounded, has non-negative Schwarzian and is either concave increasing or convex decreasing. It is shown that \mathcal{M} is a semigroup under composition that contains the sub-semigroup of fractional linear maps and each function in \mathcal{M} that is uni-linearly bounded has a globally attracting exponentially asymptotically stable fixed point. Thus we obtain a condition under which a periodic difference equation (mapping system) will have a periodic solution having the same properties. Certain restricted algebraic operations are valid in \mathcal{M} and the structure of \mathcal{M} is explored together with conjectures regarding the interlacing of roots of a rational function in \mathcal{M} . (Received September 15, 2008)