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Title: Parameter-independent structure in periodic orbits of an iterated function system on the real line

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For the iterated function system on $\mathbb{R}$ comprising the maps $f(x) = ax + 1$ and $g(x) = bx$, with $a > 0$ and $0 < b < 1$, we represent each n-cycle by the composition (or *word*) in f and g corresponding to the cycle's point of least magnitude (or *perigee*). These representations are partitioned into equivalence classes using simple combinatorial criteria. Associated with each n-cycle are n polynomials in a and b whose values at a special value of a are partially ordered. An example is given showing that, for fixed b, the perigee word of an n-cycle is a function of a; but the ordering of the polynomial values enables us to prove that the *maximal* perigee word in each equivalence class is independent of the parameters a and b.

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