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Periodic Orbits of Piecewise Monotone Maps

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Abstract: Much is known about periodic orbits in dynamical systems of continuous interval maps. Of note is the theorem of Sharkovsky. In 1964 he proved that, for a continuous map f on $\mathbb{R}$, the existence of periodic orbits of certain periods force the existence of periodic orbits of certain other periods. Unfortunately there is currently no analogue of this theorem for maps of $\mathbb{R}$ which are not continuous. Here we consider discontinuous interval maps of a particular variety, namely piecewise monotone interval maps. We observe how the presence of a given periodic orbit forces other periodic orbits, as well as the direct analogue of Sharkovsky's theorem in special families of piecewise monotone maps.