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Michelle Manes* (mmanes@math.brown.edu), Department of Mathematics, Box 1917, Brown University, Providence, RI 02912. *Rational Periodic Points for Rational Maps with Automorphisms.*

Let $\phi : \mathbb{P}^1 \rightarrow \mathbb{P}^1$ be a rational map of degree $d = 2$ defined over \mathbb{Q} and assume that $f^{-1} \circ \phi \circ f = \phi$ for some nontrivial $f \in \text{PGL}_2$. We describe families of such maps that have \mathbb{Q} -rational periodic points of period 1, 2 and 4, and we prove that no such map has a \mathbb{Q} -rational periodic point of exact period 3. We give a complete description of the \mathbb{Q} -rational preperiodic points whose period is at most 4, and show in particular that there are at most 12 such points. (Received February 26, 2007)