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A group G has the $R - \infty$ property with respect to automorphisms, if every automorphism has an infinite number of Reidemeister classes or twisted conjugacy classes. Given a finitely generated nilpotent group we study this question. For groups of nilpotency class 1 (so abelian groups) it is known that this $R - \infty$ property does not hold. On the other hand we show several positive results. We state some of them. We show that for nilpotency class 2 we have a Nilpotent group which has Hirsch length 6. It seems to be the lowest possible length that this can happen. Also we show that the free Nilpotent group on two generators and nilpotency class 8 also has this property. As an application follows that many Nilmanifolds have the property that any homotopy equivalence can be deformed to a fixed point free map. (Received August 21, 2006)