Abstract

We seek to characterize the 3-adic valuations of the family of functions $xx2+aa$, and what values of aain one of three forms ($3\alpha\alpha+1$, $3\beta\beta+2$, $3\gamma\gamma+0$) determines $vv3(xx2+aa)$ to be. We partition the family of functions into three conjectures, depending on the three forms of aa. Finally, we prove one of the three conjectures, that $vv3xx2+3\alpha\alpha+1=0$for any natural number xx.