About new examples of Serret’s curves

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Abel’s theorem claims that the lemniscate can be divided into $n$ equal arcs by ruler and compass iff $n = 2^kp_1...p_m$, where $p_j$ are pairwise distinct Fermat primes. The proof relies on the fact that the lemniscate can be parametrised by rational functions and the arc length is an elliptic integral of the first kind of the parameter. In 1845, Serret proposed a method to describe all such curves. He found a series of such curves and described its important properties. Since then, no new examples of curves with rational parametrisation, such that arc length is an elliptic integral of the first kind of the parameter are known. In this note we describe anew example of such curve.