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High rank elliptic curves with prescribed torsion group over quadratic fields

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**Abstract.** There are 26 possibilities for the torsion group of elliptic curves defined over quadratic number fields. We present examples of high rank elliptic curves with given torsion group which give the current records for most of the torsion groups. In particular, we show that for each possible torsion group, except maybe for $\mathbb{Z}/15\mathbb{Z}$, there exist an elliptic curve over some quadratic field with this torsion group and with rank $\geq 2$. 