

# Elliptic curves over quadratic fields with fixed torsion subgroup and positive rank

(Talk)

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For each of the torsion groups  $\mathbb{Z}/2\mathbb{Z} \oplus \mathbb{Z}/10\mathbb{Z}$ ,  $\mathbb{Z}/2\mathbb{Z} \oplus \mathbb{Z}/12\mathbb{Z}$ ,  $\mathbb{Z}/15\mathbb{Z}$  we will determine the quadratic field with the smallest absolute value of its discriminant such that there exists an elliptic curve with that torsion and positive rank. For the torsion groups  $\mathbb{Z}/11\mathbb{Z}$ ,  $\mathbb{Z}/14\mathbb{Z}$  we will solve the analogous problem after assuming the Parity conjecture.

MSC2010: 11G05, 14H52, 11R11.

Keywords: elliptic curve, torsion group, rank, quadratic field.

Section: Number Theory.