

1133-11-244

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*Torsion subgroups of rational elliptic curves over infinite extensions of  $\mathbf{Q}$ .*

Let  $E/\mathbf{Q}$  be an elliptic curve. In this talk we consider the question of what torsion subgroups can occur when we base extend  $E$  to some infinite field extensions  $K/\mathbf{Q}$ . For example, if  $K$  is the compositum of all cubic extensions of  $\mathbf{Q}$ , we show that the torsion subgroup of  $E(K)$  is finite and determine 20 possibilities for its structure. This work is partially joint with Álvaro Lozano-Robledo, Filip Najman, and Andrew Sutherland (Received July 27, 2017)