1145-11-793   **John Cullinan***, Department of Mathematics, Bard College, Annandale-On-Hudson, NY 12401.
A probabilistic local-global principle for torsion on elliptic curves.

Fix an integer $m > 1$. Let E be an elliptic curve over $\mathbf{Q}$ with the property that $\#E(\mathbf{F}_p)$ is divisible by m for all but finitely many primes p. While E is isogenous to an elliptic curve E' such that $\#E'(\mathbf{Q})_{\mathrm{tors}}$ is divisible by m, but it may not be the case that $\#E(\mathbf{Q})_{\mathrm{tors}}$ is divisible by m. Ordered by height, we show the probability that a curve with $m \mid \#E(\mathbf{F}_p)$ also has $m \mid \#E(\mathbf{Q})_{\mathrm{tors}}$ is nonzero and we compute the probability explicitly in several cases. This is joint work with John Voight. (Received September 14, 2018)