1106-VO-375 **Joshua Boone*** (josh.boone@lmunet.edu), 6965 Cumberland Gap Parkway, Hamilton Math & Science Building, Rm 330, Harrogate, TN 37752. *The n-th Power of a General 2x2 Matrix.* Preliminary report.

Even for small values of $n \in \mathbb{Z}$, it is sometimes helpful to find M^n, the n-th power of a square matrix M, without explicitly multiplying n copies of M together. We will show two interpretations and formulas for M^n when $M \in GL(2, \mathbb{Z})$. A new recursive construction of a formula will be given for the case where M represents a linear fractional transformation. We will then determine when it is possible to find a transformation of a given order n and give an explicit formula for these cases. (Received August 26, 2014)