1125-51-2532 **William Soller** (`sollerw@southwestern.edu`) and **Kristen McCrary***
(`mccraryk@southwestern.edu`). *Existence, Uniqueness, and Cost-Optimizing Results of Mathematical Trusses.*

Mathematical trusses are abstract geometric objects which are applied to model or design various physical structures. Truss research typically involves questions of construction (existence and uniqueness of truss structures) as well as optimization (minimizing the cost of the truss). In this work, we present necessary and sufficient conditions for existence and uniqueness of certain restricted trusses (called grid trusses), as well as arguments for non-uniqueness in other grid trusses. We also apply calculus of variations techniques to explore the cost-reducing effect of cutting corners on four-beam trusses. This work extends known results on three-beam corner trusses. (Received September 20, 2016)