

1077-11-1588

**Helen G. Grundman** and **Laura L. Hall-Seelig\*** (hallseelig1@merrimack.edu). *Integer Solutions to  $xyz = 1$  and  $x + y + z = k$  in Number Fields of Degree at Most Four*. Preliminary report.

For fixed  $k \in \mathbf{Z}$ , we consider the problem of finding all solutions to the system of equations

$$xyz = 1 \quad \text{and} \quad x + y + z = k$$

with  $x, y, z$  algebraic integers in fields of degree at most four over  $\mathbf{Q}$ . Restricting to the values of  $k$  for which a related elliptic curve has a finite group of rational points, we find all points on the curve with coordinates in quadratic fields (not necessarily integers) and, as a corollary, solve the problem for degree 2 and these values of  $k$ . We then use these results to find solutions to the given equations in integers in quartic fields. (Received September 20, 2011)