1037-15-247 **Aaron Lauve*** (lauve@math.tamu.edu), Texas A&M University, Department of Mathematics, MS 3368 (601 Blocker), College Station, TX 77843-3368. *On matrix inversion using mixed information.* Preliminary report.

Given an $n \times n$ matrix $A = (a_{ij})$ over $\mathbb{Q}$, the n^2 equations $AX = I$, if solvable, define a right inverse for A. It is a small wonder that (i) one reaches the same solution in solving the n^2 *different* equations $XA = I$, and (ii) the solution is unique. We are led to the following question: from the $2n^2$ equations mentioned above, which choices of n^2 yield a unique solution X? The case $n = 2$ is already interesting, involving a (reducible) Coxeter group of order 8 and the result that the two extremal choices above are the *only* ones that do not require additional assumptions on A (e.g., a_{11} and a_{12} are nonzero). The original question comes from theory of rational languages, where it is more natural to state things over a *noncommutative field*. Time permitting, we will highlight these results as well as progress on the cases $n > 2$. (Received February 04, 2008)