Society for Undergraduate Mathematics

Presents:

Research Experience
for Undergraduates at Temple:

Irreducible solutions (Continued)

by Edward S. Letzter

We will continue our study of irreducible $n \times n$ matrix solutions to noncommutative polynomial equations. In the previous lecture we discussed the equations $XY = -YX$, $XY = YX$, $XY - qYX = 1$. We learned that complex $n \times n$ matrices X and Y constitute an *irreducible solution* if they solve the given equation *and* generate the set of all $n \times n$ complex matrices via matrix arithmetic.

In this lecture we will also consider the mysterious equation $XY - YX = 1$. It is an exercise for the adventurous to prove that this equation has *no* complex $n \times n$ matrix solutions. However, there is an infinite dimensional irreducible solution (?!!) based on the product rule for derivatives, from first semester calculus.

Thursday November 21, 2002
Wachman Hall, Room 617, 4:00pm
Graduate students are especially welcome!
Free Doughnuts and Coffee will be available from 3:45 to 4pm.