Problem of the Week-2

Let $\mathbb{F}_q$ be the finite field with $q$ elements. Find the number of $n \times n$ invertible matrices over $\mathbb{F}_q$. Explain your answer. If you write down a random $3 \times 3$ matrix over $\mathbb{F}_4$, is it more likely to be invertible, or not? Justify your answer.  

\footnote{Posting Date 1/26/08. Submit solutions to Noah Aydin, RBH 319 (e-mail or hard-copy, but hard copy submissions must include a time stamp) by 4 pm on 2/8/08.}