Quantitative Reasoning 28:
The Magic of Numbers

Homework 23

Assigned on Friday November 30th
Due at 12 noon **Monday** December 2nd

Please submit problem sets at the end of the relevant lecture, or leave in the box labeled QR28 outside the Math Department's main office, on the third floor of the Science Center (Room 325).

Reading:

Gross-Harris, Chapter 13

Problems:

Please explain your reasoning and show your work.

1. Compute the following:
   (a) $\phi(29)$. (Here $\phi(n)$ is Euler's phi function, as discussed in lecture.)
   (b) $\phi(77)$.
   (c) $\phi(6615)$.
2. $3^{28} = 1 \pmod{29}$ by Fermat's Little Theorem (since 29 is prime).
   Compute $3^{60} \pmod{77}$.