Quantitative Reasoning 28:
The Magic of Numbers

Homework 24

Assigned on April 18
Due at 5:00 p.m. April 20

Please submit problem sets to the boxes outside the Math Department's main office, on the third floor of the Science Center (Room 325).

Reading:

Gross-Harris, Chapters 13 and 20

Problems:

Please explain your reasoning and show your work.

1. (a) What are the last three digits of 7^{1217}?

    (b) What are the last two digits of $3^{\left(3^{333}\right)}$? Note: This is not the same number as $\left(3^3\right)^{333}$.

2. (a) Compute the 11th root of 2 (mod 105).

    (b) Compute the 5th root of 4 (mod 43).

3. Determine x (mod 703) given that $x \equiv 1$ (mod 19) and $x \equiv 4$ (mod 37).