Quantitative Reasoning 28:
The Magic of Numbers

Homework 29

Assigned on April 29
Due at 5:00 p.m. May 2

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

Problems:

Please explain your reasoning and show your work.

1. Suppose, as discussed in today's lecture, that you wish to run the sieve of Eratosthenes on the numbers between 2 and 200.

   (a) After the first pass (that is, after keeping the 2 as prime and then crossing out all the multiples of 2) how many numbers are left? You don't need to actually run the sieve; instead you can use the counting methods we've discussed.

   (b) What percentage of the original numbers are left after this first pass?

   (c) After the second pass (that is, after keeping the 3 as prime and then crossing out all the remaining multiples of 3) how many numbers are left? Again, you can do this by counting.

   (d) What percentage of the original numbers are left after this second pass?

2. (a) Using the sieve of Eratosthenes, find all the primes between 160 and 200.

   (b) What percentage of the numbers between 160 and 200 are prime?