MA 350 Dr. G. Stoudt
Seventh Reading Assignment

Readings

- Biography of Eratosthenes, page 153
- Reading 40: From *Introduction to Arithmetic* I: Chapters XII and XIII (Sieve for Finding Primes)- Nichomachus of Gerasa
- Biography of Diophantus, page 171
- Reading 45: From the Dedication to *Arithmetica* (Algebraic Notation)-Diophantus
- Reading 46: From *Arithmetica* (Origins of Number Theory)-Diophantus

Notes for the Readings

Note the following from the *Elements* for your reading (See Reading 7):

Definition VII.13: A composite number is that which is measured by some number.
Definition VII.14: Numbers composite to one another are those which are measured by some number as a common measure.

Questions for Discussion

Reading 45

1. Diophantus knows the rules for multiplying a "minus" by a "minus" and a "minus" by a "plus", yet the biography of Diophantus states that he accepted only positive rational roots. Why might you need to know the rules for multiplying a "minus" by a "minus" and a "minus" by a "plus" to solve equations even if you only accept positive solutions?

2. What do you think Diophantus would call x^7, x^8, x^9, x^{10}?

Reading 46

1. In IV. 29, does $x^2 + x + \frac{1}{4}$ come out of nowhere? Why does Diophantus use this particular perfect square trinomial?

2. In IV. 30, does $x^2 - x + \frac{1}{4}$ come out of nowhere? Why does Diophantus use this particular perfect square trinomial?

Homework Problems

1. Divide 25 and 36 into two squares **using Diophantus' method**.

2. Use Diophantus' method to find four square numbers such that their sum added to the sum of their sides is 73.

3. Use Diophantus' method to find four square numbers such that their sum minus the sum of their sides is 15.

4. Prove that if 3 measures an odd number k times, then 3 measures the odd number "two places removed" $k+2$ times.

5. Prove that if 5 measures an odd number k times, then 5 measures the odd number "four places apart" $k+2$ times.