

Material Covered: Chapters 4.1-4.2, 5.2, 6.5-6.9, 7 of text.

Test 2 will be similar to Test 1, around 15 problems with your choosing any 10 to do at 10 points each. *Two of the problems will be repetitions of problems on the first test, so study the key from the last test.* **Remember to bring a blue book.**

1. Know the basic ideas of Ptolemy's astronomy, in particular notions such as celestial equator, ecliptic, eccenters, epicycles, seven wanderers, equinox. Know what a great circle on a sphere is. For circles know Ptolemy's theorem, and how to work simple problems related to it. Understand how he constructed his chord table with $R = 60$. Review homework handout 4.4.

2. Be able to solve equations of the type given in the homework and Quiz 6 related to the mathematical work of Diophantus.

3. Know the approximate dates for the flourishing of Hindu mathematics, and some of their major mathematical contributions. Be able to solve linear diophantine equations $ax + by = c$, including finding the g.c.d. of the coefficients a, b using the Euclidean algorithm, testing whether there is a solution, finding a solution using back substitution and scaling, and finding the form of the general solution. Know the definition of the half-chord and its connection with the modern sine function. Know the Indian contributions to the decimal place value system for numbers and the Hindu lattice multiplication method. How did the Hindu solutions for diophantine equations differ from those of Diophantus? What is the Pell equation?

4. Know the approximate dates for the flourishing of Islamic mathematics and some of the major mathematical contributions. Know how to solve quadratics by completing the square ala' Al-Khwarizmi. Know basic summing formulas, elementary manipulations with square roots, and basic knowledge of amicable numbers. Know contributions of Islamic mathematics to the development of Hindu-Arabic numbers.

5. Quiz keys for these sections will be posted on my door, Lockett 216.