Classical Algebra

Written Assignment No. 1

due Tuesday, September 26, 2006

Directions

Written assignments must be typeset.

While it is neither necessary nor desirable to show small details of computation, you must indicate what you are doing, give major steps in computation, and explain any reasoning used.

Accuracy is important. With 5 problems in an assignment worth 5 points, there will be no room for partial credit on a problem.

If you are in the writing intensive division of the course, you must complete each written assignment in a satisfactory way. This may require re-submission, possibly more than once, after the initial evaluation.

Problems

1. Let d denote the greatest common divisor of the integers 2313 and 2235. Find integers x, y such that
$$2313x + 2235y \;=\; d \quad .$$

2. Find the least common multiple of 2235 and 2313.

3. Find the continued fraction expansion of the rational number 2313/2235.

4. Decompose 301557375 into prime factors.

5. Write a proof of the following:

    If a and b are positive integers and d the greatest common divisor of a and b, then every common divisor of a and b is a divisor of d.

    Note: Before undertaking this task, take careful note of the definitions of *common divisor* and *greatest common divisor* found in § 3A of the course text.