

# MATHEMATICS 153, SPRING 2021, QUIZ 2

**Directions:** The answers to this quiz are to be submitted to the instructor of your discussion section by **11:59 P.M.** on **Tuesday, May 25**. Please include your name, student identification number, and discussion section number on the worked out quiz.

1. Take the last four digits **ABCD** of your student identification number and solve the following iterated Chinese Remainder Problem:

$$x \equiv A \pmod{5}, \quad x \equiv B \pmod{7}, \quad x \equiv C \pmod{11}, \quad x \equiv D \pmod{13}.$$

Recall that such a system is equivalent to a sequence of problems involving two congruences (the solution of the first two is a congruence, and one then finds a solution for the first three by considering the solution of the first two together with the third, and so on).

2. Using the methods described on page 3 of the document <https://math.ucr.edu/~res/math153-2021/week07unit08/history08.pdf> find a solution to the system of equations  $pq = 27$  and  $p^2 + q^2 = 64$  such that  $p = a + \sqrt{b}$  and  $q = a - \sqrt{b}$ , where  $a$  and  $b$  are nonnegative rational numbers.

You may use a simple calculator (only the four basic arithmetic operations) or something equivalent to work on this quiz. Although you may consult with other students and the teaching assistant(s) about these problems, the quiz is **NOT** collaborative; the answers you submit must be your own work and no one else's.