

Math 40520 Theory of Number

Homework 1

Due Friday, 9/7, in class

Do 5 of the following.

1. Exercise 1.10 on page 19 in the textbook.
2. Exercise 1.12 on page 20 in the textbook.
3. Exercise 1.14 on page 20 in the textbook.
4. Find two integers x and y such that $455x + 1235y = 65$.
5. Write 3.06015625 in base 20.
6. Consider the integer $n = 199!$.
 - (a) How many 0-s does n end in when written in base 10?
 - (b) How many 0-s does n end in when written in base 12?
7. Let p be a prime number and $m, n \geq 2$ two integers. Show that the power of p in the factorization of $\binom{m+n}{n}$ equals the number of carries necessary to add $m + n$ when written in base p .