

15-151 Homework 1

Please submit in class at 8:00am on Thursday 6th July

Exercises

1. Prove that if an integer a leaves a remainder of r when divided by an integer b , then it leaves a remainder of r when divided by $-b$. [10 points]
2. Let $a, b \in \mathbb{Z}$. Prove that if d divides a and d divides b , then d divides $au + bv$, where u and v are any integers. [10 points]

Other tasks

3. Read the syllabus and sign the attached agreement form. [5 points]
4. Register for a (free) account at ShareLaTeX (<https://www.sharelatex.com/>). Create a new project, and upload the file `template.tex` (available on the course web page) to the project. Change the name and date to your name and today's date. Press 'Recompile' and download a PDF of the template file. Send the resulting PDF file to cnewstead@cmu.edu with your name in the subject line. [5 points]
5. Fill out the questionnaire located at <https://goo.gl/forms/zu9n74HL9ucjzYp63> [5 points]

Optional but recommended tasks (not for credit)

6. Go say hi to Alp in Doherty Hall 1217 during academic hours this evening (6:30–9:00pm). Alp a Mathematics major who probably has a lot to say about his experience at CMU, the college admissions process, and so on! He will go over some of the concepts from class during the first ~ 45 minutes, and will be available to answer questions for the rest of the time.
7. In this course, we adopt the convention that 0 is a natural number. Some people prefer to exclude 0, so that the natural numbers start at 1. Think of a reason why someone might want to consider 0 as a natural number, and a reason why someone might want to exclude it. What problems might this mismatch raise for mathematicians? Does this make mathematics less precise? Why or why not?