

Math 4060 (Cherry)

Reading and Individual Study

We will take a little break from careful proofs and have a little fun with ruler and compass constructions. Read section 2 of Hartshorne (pages 18–23).

Work problems 2.1–2.6 on pages 23–24. Everyone should know how to do all of these fundamental constructions. You will be asked to write up two of these to turn in below, but be sure you know how to do all of them.

Written Assignment Due Wednesday, February 8 (Assignment #6)

Re-read carefully the “counting steps” section of Hartshorne on pages 20–21 and write-up the two problems assigned to you.

Read the directions at the top of page 23. In particular, you are asked to find an efficient construction that does what is asked. You are asked to count your steps and neatly do the construction (with a ruler and compass). Hartshorne gives “par” values to give you some idea roughly how many steps you should use. I will give full-credit for any correct solution that does not go more than 20% over Hartshorne’s par value [rounded to the nearest step] (so if $\text{par}=4$, you can use up to $4.8 \approx 5$ steps; if $\text{par}=9$, you can use up to $10.8 \approx 11$ steps, *etc.*), I will give near full-credit for *any* correct construction, and I will give bonus points for constructions that beat Hartshorne’s par values (not always possible). Keep in mind that in this section you are NOT asked to give a formal proof that your constructions work. **HOWEVER, you must give a brief argument about why it is at least plausible that your construction is correct**, and you ARE asked to compare your constructions to Euclid’s, which you will need to find on your own (somewhere in Books I, III, or IV.)

First Letter of Last Name	Problem
A–C	2.4, 2.6
D–F	2.4, 2.5
G–J	2.3, 2.5
K–M	2.3, 2.6
N–P	2.3, 2.5
Q–S	2.3, 2.6
T–V	2.4, 2.5
W–Z	2.4, 2.6

Written Assignment Due Friday, February 10 (Assignment #7)

Everyone write up solutions to Hartshorne Exercises 2.7 & 2.8 using the same rules as in the previous assignment. In particular, do not forget to give a reason as to why it is plausible that your constructions work and a comparison to Euclid.