

**Homework #4: Orthocenter and Centroid****College Geometry**

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In this activity you will carry out some basic constructions using GeoGebra. If you have never used GeoGebra before, don't worry; for what we need it to do, it is fairly straightforward. If you get stuck, ask for help!

Each of the following problems should be constructed on a separate file, and these files should be given descriptive titles **including your name and the activity number**. When you are finished, email the files to me. So I should get four files from you, with names like "Nathan Bloomfield - A1 - construct equilateral triangle.ggb".

Finally, **your constructions must be robust**. Every geometric construction starts with one or more *free elements*; these are points and lines given in the hypotheses of the construction proof. You should be able to **move the free elements around** without destroying your construction.

1. **Construct the orthocenter of a triangle.** Start by placing three free points  $a$ ,  $b$ , and  $c$ , and draw the segments  $\overline{ab}$ ,  $\overline{bc}$ , and  $\overline{ca}$ . Following the proof we gave in class, construct the orthocenter of  $\triangle abc$ .

Make your construction into a GeoGebra tool.

2. **Construct the centroid of a triangle.** Start by placing three free points  $a$ ,  $b$ , and  $c$ , and draw the segments  $\overline{ab}$ ,  $\overline{bc}$ , and  $\overline{ca}$ . Following the proof we gave in class, construct the centroid of  $\triangle abc$ .

Make your construction into a GeoGebra tool.