

Mathematics 226H – Geometry I: Euclidean geometry
TRENT UNIVERSITY, Winter 2008

Problem Set #1

Due on Friday, 18 January, 2008.

For this problem set you will need to read the handouts with Euclid's and Hilbert's axioms for geometry. If you need to, you can find them in pdf format on the course web site (at <http://euclid.trentu.ca/math/sb/226H/>). As will usually be the case on the problem sets in MATH 226H, you may work together on this problem set and consult any sources you like in addition to the handouts and the text (except that you may not consult anyone who has taken the course before or their work), so long as you write up all the work you submit entirely by yourself, giving due credit to all relevant sources of help and information.

1. Go through Euclid's proof of Proposition I-1 in the *Elements* and identify at each step the use, implicit or explicit, of his definitions, postulates, and/or common notions. [5]
2. Try to prove, as completely as you can, Proposition I-1 in the *Elements* from Hilbert's axioms for geometry. [5]

“Parallel lines
meet at infinity,”
Euclid repeatedly,
heatedly urged,
Until he died and
so reached that vicinity—
In it he found that the
damn things diverged.

Piet Hein