

Name: \_\_\_\_\_

Pid: \_\_\_\_\_

1. (10 points) Let us consider four-lines geometry, it is a theory with undefined terms: “point”, “line”, “is on”, and axioms:

1. there exist exactly four lines,
2. any two distinct lines have exactly one point on both of them, and
3. each point is on exactly two lines.

Show that every line has exactly three points on it. (Be careful with the terms you use and axioms you use.)

2. (10 points) In Euclidean (standard) geometry, prove: If two lines share a common perpendicular, then the lines are parallel. (You do not need to use axioms of Euclidean geometry in this exercise, you can use all the standard knowledge about geometry.)