

Name: _____

Math 331 Foundations of Geometry – Crawford

Exam 1 Take-Home Portion

Due: Friday, 16 October 2015 by 3pm

This portion of the test is take-home and *you are on your honor to work alone* – you may not get help from other people, in person or via technology. By turning in the assignment with your name, you are verifying that you have worked alone on these problems. You may use books and notes for these problems. *Show all your work and clearly justify each step in the proof.* Partial credit may be given for written work. [Point values listed for each problem are approximate.] Good Luck!

Prove each of the following.

Do NOT use a coordinate function f . But you may use coordinates (e.g. a is the coordinate of point A), if it is helpful.

1. (10 pts) Let A and B be two distinct points. Prove that the set \overline{AB} is a convex set.

2. (10 pts) EXISTENCE AND UNIQUENESS THEOREM FOR MIDPOINTS

If A and B are distinct points, then there exists a unique point M such that M is the midpoint of \overline{AB} .