

MAT 360, Geometry

Spring 2011

Midterm I

Name: _____

This is a closed book, closed notes test. No consultations with others. Calculators are not allowed.

Please turn off and take off the desk cell phones, pagers, etc. Only the exam and pens/pencils should be on your desk.

Please explain all your answers, show all work, and give careful proofs. Answers without explanation will receive little credit.

The problems are not in the order of difficulty. You may want to look through the exam and do the easier questions first.

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Please do not write in this table

1	2	3	4	Total

2

1. Consider an isosceles triangle ABC (where AC is the base), and let CD be the bisector of the angle C . Suppose that the angle ADC is 150 degrees. Find angles of the triangle ABC .

2. Four houses A , B , C , D form vertices of a square. The residents would like to dig a well at a point W such that the sum of distances $AW + BW + CW + DW$ from all the houses to the well is the smallest possible. Where should they dig the well?

3. Using a straightedge and a compass, construct a rhombus whose diagonals are congruent to the two given segments. Justify your construction.

(You can use, without a detailed description, the following elementary constructions: segment and angle bisection, raising a perpendicular at a point on the line, dropping a perpendicular from a point not on the line, constructing segments and angles congruent to given ones.)

4. Let the chords AB and CD of the given circle be congruent. Extend the chord AB past the point B , the chord CD past C , and suppose that the resulting two rays intersect at the point P . Prove that the triangles APD and BPC are isosceles.