## HOMEWORK 2 - MATH 325

## DUE DATE: Tuesday, February 4 INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 5 points. It is necessary to show your work. GOOD LUCK!!

- 1. (O.Bottema<sup>†</sup>) Let BM and CN be external bisectors of the angles  $B = 12^{\circ}$  and  $C = 132^{\circ}$  of a special triangle ABC, each terminated at the opposite side. Without using trigonometric functions, compare the lengths of the angle bisectors.
- 2. The orthocenter of an obtuse-angled triangle is an excenter of its orthic triangle.
- 3.  $OH^2 = 9R^2 a^2 b^2 c^2$ .
- 4.  $DA' = \frac{|b^2 c^2|}{2a}$ .
- 5. (a) The quadrilateral AKA'O (Figure 1.8A, page 21) is a parallelogram.
  - (b) In the nine-point circle (Figure 1.8B, page 21), the points K, L, M bisect the respective arcs EF, FD, DE.
- 6. The circumcircle of ABC is the nine-point circle of  $I_a I_b I_c$ .