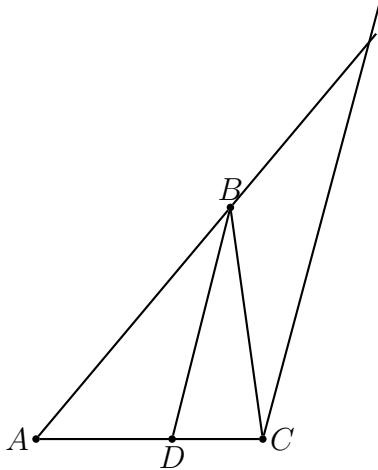# MAT 360: HOMEWORK 7
DUE WED, OCT 28

Please remember that you are only allowed to use notions and results we had proved in class!

1. In a triangle ABC, let BD be the bisector of angle B. Prove that then $AD : DC = AB : BC$. [Hint: draw a line through C parallel to BD, as shown below.]

2. Let A_1B_1, A_2B_2 be two chords of circle C, intersecting at point M inside the circle.
   (a) Prove that triangles A_1A_2M, B_2B_1M are similar.
   (b) Prove that for any chord AB going through M, the product $AM \cdot BM$ is the same.

3. Let M be a point outside a given circle. Let l be a lien which goes through A and intersects the circle at poinst A, B, and let n be a tangent line to the circle going through M; let C be the tangency point. Prove that $MC^2 = AM \cdot BM$.

4. Find the geometric locus of all the midpoints of chords passing through a given point M inside the circle.

5. Textbook, problem 378

6. Textbook, problem 408