Geometry I — Homework 3 — Due 28th Oct

1. If 3 sticks are nailed together to form a triangle at each vertex, will such a triangle be rigid? Justify your answer.

2. Prove that if all three sides of a triangle are equal, then the three angles are also equal. Also prove viceversa.

3. Let ABC and $A'B'C'$ be two triangles such that $\angle A = \angle A'$, $\angle B = \angle B'$ and $AB = 2A'B'$. What is $C'A'/CA$ and why?

4. Let ABC be an isoceles triangle, $AC = CB$ and let M be the mid-point of AB. Prove that CM is perpendicular to AB and that it bisects $\angle C$.

5. Let AD be a line segment and let C be a point in AD. Consider a point B which is not on the line containing AD. Show that $\angle BAC + \angle ABC = \angle BCD$.