Assignment 10

Oral questions

1. 5.5/12
2. Given $A * B * C$ on a line and a point D not on the line such that $DC \perp AC$. Prove that $AD > BD > CD$. (Use Theorem 3.3.6 stating that opposite to larger sides you have larger angles.)

Questions to be answered in writing

1. Let $ABDC$ be a quadrilateral whose base angles $\angle A$ and $\angle B$ are right angles. Prove that if $AC < BD$ then $\angle D < \angle C$. (Hint: Choose E between B and D on the line BD such that $AC = BE$. Apply Theorem 3.6.4 and the weak exterior angle theorem. You are allowed to use without proof the fact that E is interior to $\angle ACD$.)
2. Assume that the lines ℓ and ℓ' have a common perpendicular line segment MM'. Prove that MM' is the shortest segment between any point of ℓ and any point of ℓ'. (Hint: Assume $A \in \ell$, $A' \in \ell'$ and compare AA' to MM'. Use the previous written exercise when AA' is perpendicular to ℓ and then use the second oral exercise in the other case.)