

## Assignment 10

### Oral questions

1. 5.5/11
2. 5.5/12

### 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  $\ell$  and  $\ell'$  have a common perpendicular line segment  $MM'$ . Prove that  $MM'$  is the shortest segment between any point of  $\ell$  and any point of  $\ell'$ . (Hint: Assume  $A \in \ell$ ,  $A' \in \ell'$  and compare  $AA'$  to  $MM'$ . Use the previous written exercise when  $AA'$  is perpendicular to  $\ell$  and then use the first oral exercise from Assignment 4 in the other case.)