

## Sheet 9

**Problem 1.** Prove Lemma 4.4.3.

**Problem 2.** Prove Proposition 4.6.2.

Hint: Use the Gronwall inequality in Lemma 4.6.1.

**Problem 3.** Prove Lemma 4.6.6.

Hint: Use the previous lemma and the fundamental theorem of calculus.

**Problem 4.** Prove Lemma 4.6.7.

Hint: Use the fundamental theorem of calculus.