

# O-minimal Structures - Assignment 12

January 23, 2015

## 1 Extended Mean Value Theorem

Let  $a, b \in R$ , such that  $a < b$ . Let continuous definable functions  $f, g : [a, b] \rightarrow R$ , such that  $f$  and  $g$  are differentiable in  $(a, b)$ . Prove that there exists  $c \in (a, b)$ , such that  $(f(b) - f(a))g'(c) = (g(b) - g(a))f'(c)$ .

## 2 L'Hôpital's rule

Do exercise 2.12.1 on page 114.

## 3

Let  $a, b \in R$ , such that  $a < b$ . Let differentiable definable function  $f : (a, b) \rightarrow R$ . Prove that  $f'(x^-)$  is continuous in  $a$ .

## 4 Implicit Function Theorem

Work out the details of the proof on page 113 and 114 of the Implicit Function Theorem.