1 Extended Mean Value Theorem

Let $a, b \in \mathbb{R}$, such that $a < b$. Let continuous definable functions $f, g : [a, b] \to \mathbb{R}$, 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 $a, b \in \mathbb{R}$, such that $a < b$. Let differentiable definable function $f : (a, b) \to \mathbb{R}$. 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.