Übungen zu Analysis III

Blatt 8

1 Let $\Gamma_+^n \subset \mathbb{R}^n$ be the positive open cone, then

(i) $\varphi(x) = (\prod_{i=1}^n x^i)^{\frac{1}{n}} \leq \frac{1}{n} \sum_{i=1}^n x^i \qquad \forall\, x = (x^i) \in \Gamma_+^n$.

(ii) $\varphi \in C^\infty(\Gamma_+^n)$ and $D^2\varphi \leq 0$.

(iii) Let $M = S^{n-1} \cap \Gamma_+^n$. Determine $\inf_M \varphi$.

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2 Let $f \in C^1(\mathbb{R}^n, \mathbb{R}^m)$ with $m < n$, then f is not injective. 2