

MATH 411, HW 5

1. Find the minimum of the function $f(x, y, z) = x + 2y + 3z$ on the set $D = \{(x, y, z) : x^2 + y^2 + z^2 \leq 1\} \subset \mathbb{R}^3$.
2. Show that the unit sphere in \mathbb{R}^3 has Jordan content 0.
3. Find the Jordan content of the set $\{(x, y) \in \mathbb{R}^2 : x^2 + y = 0, -1 \leq x \leq 1\}$.
4. Let D be a closed and bounded subset of \mathbb{R}^2 . Let $f : D \rightarrow \mathbb{R}$ be differentiable. Let $E = \{(x, f(x)) : x \in D\}$. What is the Jordan content of E ?
5. Let D be a compact subset of \mathbb{R}^2 . Let $f : D \rightarrow \mathbb{R}$ be bounded. Let $E = \{(x, f(x)) : x \in D\}$. What can you say about the Jordan content of E ?