A continuous function is said to be of the form 
\[ f(x) = \int_{a}^{b} g(t) \, dt \]
where \( g(t) \) is continuous on \( [a, b] \).

Definition 1: A function \( f(x) \) is said to be continuous at a point \( c \) if
\[ \lim_{x \to c} f(x) = f(c) \]

Definition 2: A function \( f(x) \) is said to be continuous on an interval \( I \) if
\[ \lim_{x \to x_0} f(x) = f(x_0) \]
for every point \( x_0 \) in \( I \).

A linear function \( f \) on \( R^n \) is called a linear mapping (or 
linear transformation) if
\[ f(x) = Ax \]
for some matrix \( A \).

Definition 3: A function \( f \) is said to be differentiable at a point \( x \) if
\[ \lim_{h \to 0} \frac{f(x+h) - f(x)}{h} = f'(x) \]
exists.

The linear utility representation theorem states that for a function on a multidimensional space.
3. Result

Theorem: Let \( \mathcal{H} \) be a Hilbert space and \( \mathcal{D} \) be a dense linear manifold in \( \mathcal{H} \). If \( \mathcal{D} \) is non-compact, then the continuous linear functionals on \( \mathcal{D} \) are dense in the dual space \( \mathcal{H}' \).

Proof: Let \( \lambda \) be a non-continuous linear functional on \( \mathcal{H} \) with \( \lambda|_{\mathcal{D}} \neq 0 \). Define a sequence of linear functionals \( \lambda_n \) on \( \mathcal{D} \) by

\[
\lambda_n(f) = \lambda(f) + \frac{1}{n} \mathcal{N}(f)
\]

where \( \mathcal{N}(f) \) is the null space of \( \lambda \). Then \( \lambda_n \) are continuous and \( \lambda_n|_{\mathcal{D}} \to \lambda|_{\mathcal{D}} \) in the norm topology. Hence, \( \lambda_n \) is dense in \( \mathcal{H}' \) and \( \lambda \) is not in the closure of \( \mathcal{D}' \). Therefore, \( \mathcal{D} \) is non-compact.
References

After reviewing the document, it appears that the text is largely inaccessible due to the quality of the image. However, a few general observations can be made:

- The text seems to be discussing economic theory, possibly including economic equations and theories.
- The references at the end indicate that the document might be an academic or professional text, likely to be of interest to economists or students of economics.

Due to the nature of the text, a detailed analysis or translation is not possible with the current image quality.