Closest Point Property

Suppose H is a Hilbert space $A \subset H$ closed and convex. then if $x \in H$, there exists a unique $z \in A$ closest to x. There exists a unique $z \in A$ closest to x such that

$$d(z, x) = \inf_{y \in A} d(y, x).$$

Proof. Take any sequence $(y_n)_n$ such that

$$d(y_n, x) \to d = \inf_{y \in A} d(y, x)$$

$\square$

Closest Point Property
Metric Completeness
Egoprox Sequences
Metrics
Sequences
Distance
Real Numbers
Direct Products
Length Common Notions
Rational Numbers
Natural Families
Integer Numbers
Families
Function Composites
Functions
Zero
Natural Order
Relations
Equation Solutions
Natural Numbers
Ordered Pairs
Set Intersections
Set Unions
Empty Set
Unordered Pairs
Power Set
Set Specification
Set Inclusion
Sentences
Equations
Set Equality
Identity
Sets
Objects