



## 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

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

□