Notes

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someYear

Functional analysis is a really cool branch of mathematics. Imagine analysis, and then add linear algebra. And then make it all **INFINTITE DIMENSIONAL**. It's super geometrical and stuff.

Contents

1 the first part

1.1 a cool proof

Remark 1.1. *asdlfasdf*

Theorem 1.2. *(The projection theorem). Let H be a Hilbert space, let $M \subset H$ be a closed subspace of H. Let $x \in H$. Then,*

$$\exists! m_0 \in M \text{ such that } \|x - m_0\| = \inf_{m \in M} \|x - m\|$$

and m_0 is characterized by

$$x - m_0 \in M^{\perp} \text{ i.e. } x - m_0 \perp m \quad \forall m \in M$$

Proof. Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod Lorem ipsum dolor sit amet, consetetur sadipscing elitr, sed diam nonumy eirmod □

Example 1.3. *(The projection theorem). Let H be a asdfklasdflkasd*

$$\|x - m\|$$

bro bro

guass

Lemma 1.4. *(The projection theorem). Let H be a asdfklasdflkasd*

$$\|x-m\|$$

bro bro

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Corollary 1.5. *(The projection theorem). Let H be a asdfklasdflkasd*

$$\|x-m\|$$

bro bro

$$guass$$

Definition 1.6. *asdfasdf*