Axler 6.A exercise 9 April 27, 2021

## 1 | Axler 6.A exercise 9

Suppose  $u,v\in V$  and  $\|u\|\leq 1$  and  $\|v\|\leq 1$ . Prove that

$$\sqrt{1 - \|u\|^2} \sqrt{1 - \|u\|^2} \le 1 - |\langle u, v \rangle|$$

## 2 | **Proof**

We will prove this by showing that the left hand side is less than or equal to an intermediate term, which is less than or equal to the right hand side.

$$|\langle u, v \rangle| \le ||u|| ||v|| \implies$$

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